ONTARIO TASK FORCE

ON PROVINCIAL RAIL POLICY

WORKING PAPERS

ANALYSIS – VOLUME I

INTERIM REPORT – SEPTEMBER, 1980

Ontario

MARGARET SCRIVENER, M.P.P.
CHAIRMAN

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PARLIAMENT BUILDINGS,
TORONTO
SEPTEMBER, 1980

Ontario

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TABLE OF CONTENTS

VOLUME I

TABLE OF CONTENTS

VOLUME II

TABLE OF CONTENTS

VOLUME III

PAGE NO.

FOREWORD

When Members of the Ontario Task Force on Provincial Rail Policy commenced deliberations in January of this year, we wished to survey and evaluate the rail mode as fully as possible within the timeframe provided.

To expedite our investigations, the Task Force called upon various individuals and organizations to produce specific 'working papers' relating to various aspects of the railways and their interaction with our provincial community. Although several papers have been produced by private sector consultants, the vast majority are the result of research and investigation of specialist staff within the Government of Ontario.

The writers were invited to look ahead and, wherever appropriate, offer any recommendations which in their opinion might assist the Task Force in preparing its final report. The response has been gratifying and helpful, and on behalf of the Members of the Task Force I wish to express sincere appreciation to each of the participating Ministries for a job well done.

This resource document contained in three volumes is presented as part of the Interim Report of the Ontario Task Force on Provincial Rail Policy.

Margaret Scrivener.

Margaret Scrivener (Mrs.),
CHAIRMAN.

HISTORY

A HISTORY OF RAILWAYS IN ONTARIO

ANDREAE
ASSOCIATES

A HISTORY OF RAILWAYS IN ONTARIO

Prepared For:

The Ontario Task Force on
Provincial Rail Policy

Prepared By:

Christopher Andreae
ANDREAE ASSOCIATES,
Parkhill, Ontario

July 21, 1980

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July 21, 1980

Frank Norman, Coordinator
Ontario Task Force on
Provincial Rail Policy
Room 172
Legislative Building
Queen's Park
Toronto, Ontario
M7A 1A2

Dear Mr. Norman:

Enclosed please find one copy of the final report "A History of Railways in Ontario". In addition, two sketch maps have been prepared and submitted separately, showing the railway network in Ontario for 1860 and 1917.

Yours truly,

Christopher Andreae

CA/sh

A HISTORY OF RAILWAYS IN ONTARIO

Table of Contents

...continued

Table of Contents

1. Overview:

Transport facilities in Ontario evolved slowly over the previous century and a half. From canoe routes and corduroy roads to super highways and double track railways, transportation has become easier, faster and cheaper in the province. When pioneers first arrived in Ontario, waterways were often the only possible means of access to central Canada. Slowly, roads were constructed, pushing settlement inland. From approximately 1850 onward, railways provided the mainstay of the transportation system in Canada. Since the 1920's roads, and later, airlines and pipelines have added to and improved transportation facilities in Ontario. Today, Ontario enjoys a high standard of transport services provided by a variety of modes.

2. Pre Railway Transportation

2.1 Waterways:

The Great Lakes system has, to a great degree, determined the course of transportation development in Ontario. Lakes Erie, Ontario, Huron, and Superior together with their connecting river links form a continuous water route for over a thousand kilometers through the province. At first the lakes provided a means of communication for early explorers and fur traders. Later, they became commercial water routes by which the commerce of the country could be economically exported to markets. And finally, most recently, the lakes have acted as barriers to land transportation forcing roads and railways to be funnelled through selected transportation corridors.

Early settlements in Ontario were situated close to navigable water. Wherever good harbours could be found, small ports sprang up. Port Hope, Oakville and Port Stanley are a few of the numerous such communities that evolved during the early nineteenth century. When natural waterways were not adequate for commercial purposes, canals were dug. The St. Lawrence River required several short canals to overcome rapids. The Rideau Canal was built between Ottawa and Kingston primarily for military reasons. The Welland Canal provided a connection between Lake Erie and Lake Ontario around Niagara Falls.

2.2 Roads:

By the 1820's and 1830's settlement in Ontario had begun to move inland away from navigable waterways. Roads had to be hacked through forests and wilderness to enable pioneers to reach their farms and export their produce. Most often these roads were little more than trails, wide enough to let a horse and wagon through and with tree stumps cut low enough so that the axle could pass over them. Where necessary, a crude bridge might have to be erected over a stream or a corduroy road laid over a swamp. Road engineering was very rudimentary during the early period of settlement. Without proper ditching and surfacing, roads frequently became impassable quagmires during spring and fall. Nevertheless, despite the poor condition of roads during much of the nineteenth century, they did offer a viable means of transportation for the farmer. Most of the shipping from farms was done during the winter

months when stumps, potholes, swamps, mud and other unpleasant features disappeared under a smooth layer of snow. Although these conditions impossed seasonal patterns on travel, they were not onerous restrictions to farmers since winter was a period of least activity on farms. Thus it was possible for farmers to take several days, if necessary, to team crops to market town or lake port. As towns and villages grew in size and as new roads spread out through the colony, stage coaches were introduced. By 1850, regular stage coach services operated between most major communities in Canada West (Ontario).

2.3 Transport Problems:

Pre-railway transportation facilities in Canada West consisted of waterways, frozen for four or five months per year, and roads that were generally impassable in the spring and fall. As population expanded, communities grew, industries developed, and new demands were created for improved internal communications. Water and roads could not meet the increased transport needs of the colony. A solution to these limitations seemed to be railways.

3. First Railway Construction Era

3.1 Early Attempts:

Steam railways first appeared in England during the 1820's and soon afterwards in the United States. Very quickly these lines evolved from short systems of local importance to large intercity companies. Railways possessed several advantages over water and road travel. Railway trains were much faster than either ships or road traffic and could operate year around. As well, railways could carry greater quantities of freight than road traffic. However, railways were expensive to build and required considerable business in order to justify construction.

Only one railway existed in Ontario prior to 1850; a short, horse-powered line opened in the 1830's, used to portage freight around Niagara Falls. A number of companies had been chartered in the 1830's but inability to raise funds coupled with a financial depression prevented construction.

Nevertheless, during the 1840's the need for railway facilities increased. Settlement of the country was growing and prosperous communities, such as Peterborough, Guelph, and London, were located inland away from convenient water transportation. Commercial requirements of the country expanded proportionately. Farmers demanded inexpensive export routes for their products and similarly were asking for a wider range of manufactured goods that had to be imported.

3.2 Finance:

One principal obstacle to railway development in Canada was lack of construction funds. With little private investment capital in the country, raising the necessary money was impossible. As well, the colonial government of Canada was reluctant to invest in railway building. The government had invested heavily in finishing a number of canals along the St. Lawrence River during the 1830's and 1840's. They were now unwilling to subsidise a competing form of transportation.

The turning point for railway development in Canada was passage of the Guarantee Act in 1849 by the

colonial government. This Act authorised the government to guarantee the interest up to 6% per annum on one-half of the bonded debt of any railway over 120 kilometers long, provided that half the distance had already been completed. This Act was designed to make Canadian railway securities a safe and attractive investment for foreign investors. By 1850, the first railway construction boom in Ontario was underway. From virtually no trackage operating in 1850, over 2,000 kilometers were completed in the ensuing decade in Canada West.

3.3 Railway Companies:

Two companies dominated railway development in Ontario, the Great Western and the Grand Trunk (both now part of Canadian National). These lines were largely financed by British capitalists.

The Great Western Railway, stretching from Niagara Falls through Hamilton and London to Windsor, was completed in 1854. One of the prime purposes of the railway was to provide a connection between railways in New York State, and hence Atlantic coast ports, and Michigan State railways serving expanding American midwest trade. The Great Western became the first of several so called "bridge" railways to cross southern Ontario. In addition to this bridge traffic, the Great Western provided regional rail service along its routes.

The Grand Trunk Railway was by far the larger of the two companies. When completed in 1859, it extended 1,300 kilometers from Portland, Maine; through Montreal; Toronto; and Sarnia to Detroit, Michigan. Originally, the Grand Trunk had been proposed only as a constituent part of a trunk line network running from Ontario to the Maritimes that included the Great Western Railway as the western end. By 1853, however, the Grand Trunk realised that a direct United States connection at Sarnia was desirable. The line was subsequently extended into Michigan as far as Detroit. Reasons for construction of the Grand Trunk were similar to those of the Great Western; the company wanted to provide an export route for products from the American west to the Atlantic coast. But, as with the Great Western, the railway also provided a transport service for local traffic along its route.

In addition to the Grand Trunk and Great Western, several smaller lines were opened in, what later

became, southern Ontario. As might be expected with new transportation technology some confusion reigned as to the best way of utilising railways. The Northern Railway and the Buffalo and Lake Huron Railway (both now part of Canadian National) were constructed with the intention of intersecting lake traffic coming down from Lake Michigan. Freight would be portaged overland from Georgian Bay and Lake Huron to Toronto or Buffalo where it would be loaded again into ships or transferred to other railways for further travel to the Atlantic coast. This rail-water combination was soon bypassed by the efficiency of all rail routes. In neither case did portage traffic become significant. The Northern provided a feeder service to the hinterland of Toronto and the Buffalo and Lake Huron became a regional carrier.

Virtually no branch lines were built by major railway companies during the first era of railway construction. Such branches as were deemed necessary were completed by private companies. Hence, the London and Port Stanley Railway (now part of Canadian National) served the Great Western at London; the Port Hope, Lindsay, and Beaverton (now part of Canadian National) served the Grand Trunk at Port Hope; and the Brockville and Ottawa Railway (now part of Canadian Pacific) served the Grand Trunk at Brockville. Over time these short lines were absorbed by larger companies and became, indeed, true branch lines.

3.4 Impact of Railways:

Benefits of railway construction were immediately perceived by citizens along railway routes:

> "Facilities for transacting business attracted numbers to the vicinity of the railway depôt, and opposition, the life of trade, came to the relief of the farmers who had previously been compelled to barter with a few old foggies upon their own terms. The travelling community too, experienced a relief that none may know who have not toiled the live-long day through mud and mire, knee deep, to reach their county town." (1)

Such glowing prose masked problems such as financial strain imposed upon communities that invested

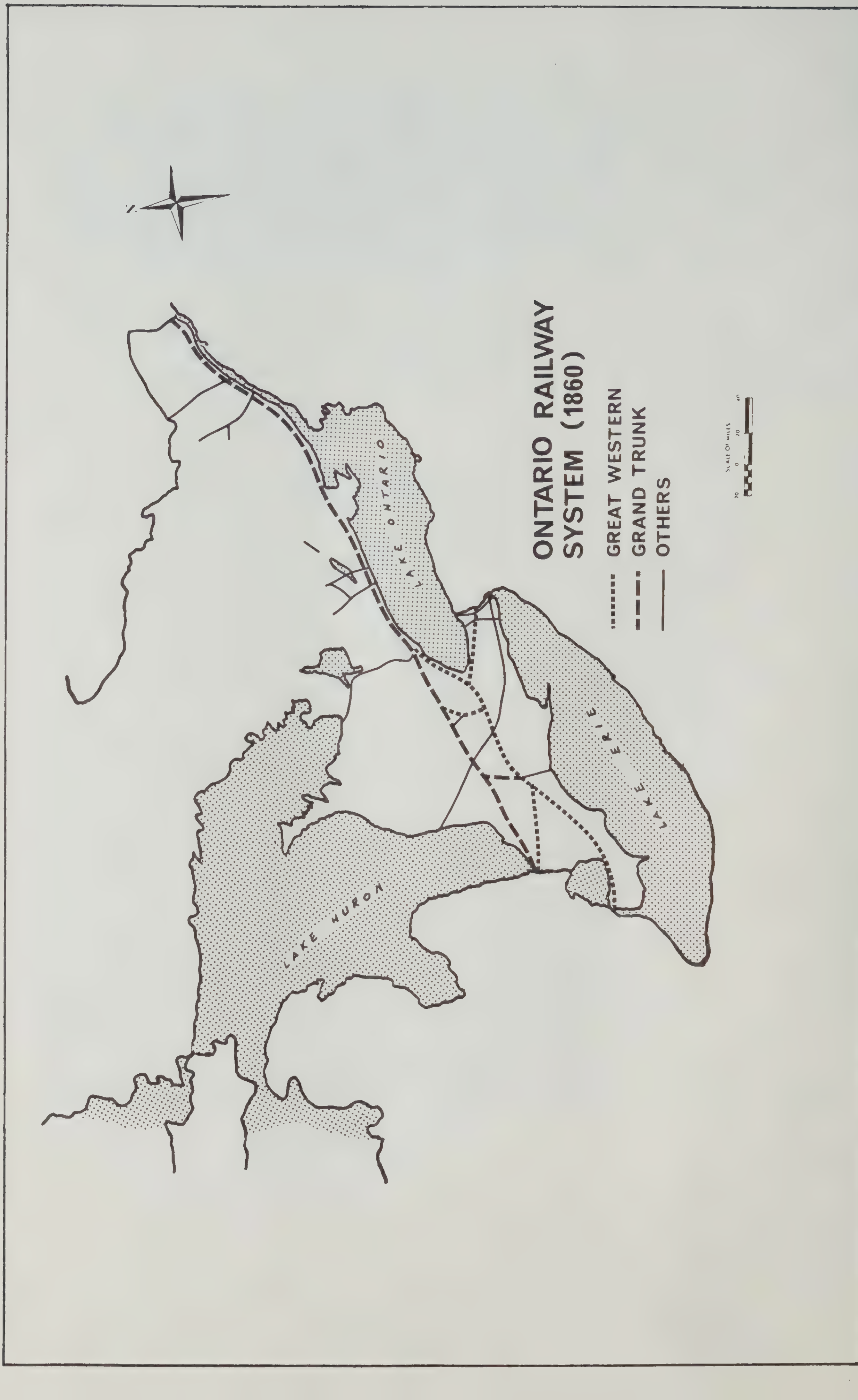
heavily in railway construction. The desire for railways and the speed with which they were built prevented many people from observing over-building and unscrupulous methods that occurred during this first railway boom. Railways were perceived as progressive elements in Canada and hence desired as an important economic institution. Only after the financial crash of 1857 and the cessation of railway construction soon afterwards, did many people finally see corruption that had been allowed to occur during the 1850's. Nevertheless, benefits of railway travel could not be ignored. Prior to the advent of railways, five days were required to make the land trip between Toronto and Montreal. In 1867, the Grand Trunk could complete the same trip in 18 hours. Farmers who previously had to team their grain long distances to port could now haul it to a nearby station.

3.5 Gauge Problem:

Although not immediately apparent, lack of a common gauge with American railways became a major problem with Canadian railways. Most Canadian railways were built on a 1.676 meter gauge while Americans were adopting a 1.435 meter gauge. Since both the Great Western and Grand Trunk relied heavily on American through traffic, all freight had to be trans-shipped at border points. The decision for using a 1.676 meter gauge in Canada was not based on any technical reason but rather on political pressure exerted by owners of the St. Lawrence and Atlantic Railway, running between Portland, Maine and Montreal. Portland wanted a different gauge from railways leading into the rival port of Boston in order to prevent traffic from its hinterland being diverted into Boston. In 1853, the St. Lawrence and Atlantic Railway became part of the Grand Trunk system. Rather than undertaking the expense of changing the railway's gauge, the promoters dumped both the railway and the 1.676 meter gauge on Canada. Within Ontario most railways constructed during the 1850's were 1.676 meter gauge and presented no obstacle to interchange of local traffic. But the Great Western and Grand Trunk soon found that the gauge difference with American railways was intolerable to through traffic. Consequently, in 1867, the Great Western laid a standard 1.435 meter gauge third rail along the main lines between Michigan and New York states. Between 1870 and 1873 the Grand Trunk followed the Great Western example and narrowed its gauge. Interestingly, while the Great Western slowly reduced its gauge, the Grand Trunk chose to narrow the entire main line between Sarnia and Fort Erie on one weekend in November, 1872.

3.6 End of First Railway Era:

The first railway building era, in Ontario, ended about 1859. Cessation of construction was accelerated by a financial depression that began in 1857. But equally important, the colony had sufficient rail routes to meet existing demand. Most inhabited areas were close to rail communications and further settlement growth was required before new rail construction was necessary.


ONTARIO RAILWAY
SYSTEM (1860)
GREAT WESTERN
GRAND TRUNK
OTHERS
LAKE ONTARIO
LAKE ERIE
LAKE HURON

4. Second Railway Construction Era

4.1 Early History:

After a lull of approximately ten years, a new period of railway expansion began in Ontario during the late 1860's. This boom lasted with varying degrees of construction activity until about 1890. Settlers had pushed further inland away from existing rail and water routes. In particular, regions north of the Buffalo and Lake Huron Railway in southern Ontario were filling rapidly with immigrants. In eastern Ontario, lumbering and extension of farm land northward encouraged the opening of a few small branch lines. However, most prominent among the various projects of this new era was completion of several new trunk line railways to compete with the Grand Trunk and Great Western.

4.2 Railway Companies:

Earliest of these trunk lines was the Canada Southern (now part of Conrail), completed in 1876. Like its competitor, the Great Western, the Canada Southern was promoted as a bridge railway between the States of New York and Michigan. The line was built as straight and level as possible, providing a direct route between Fort Erie, opposite Buffalo, and Windsor, opposite Detroit. Hence, the railway by-passed all major communities in southwestern Ontario; St. Thomas being the only town of any consequence on its route. Since most business was through traffic, American freight and passengers, lack of local commerce was not serious. Due to its strategic location, the railway was soon acquired by the New York Central Railway (now part of Conrail), one of the principal railway systems in eastern United States.

Construction of the Canadian Pacific transcontinental railway around Lake Superior, provided the first railway access to northern Ontario. Although the full mineral and timber potential of the northern part of the province was not fully comprehended at this time, the Canadian Pacific mainline later became a base from which other railway lines extended into the north. A branch line from Sudbury to Sault Ste. Marie was completed in 1888. Originally intended as part of the transcontinental line, this track was relegated to secondary use. The final route of the Canadian Pacific veered further north from this line.

The Canada Atlantic Railway (now part of Canadian National), completed in 1896, was the last major railway built during the second railway era. Stretching from the New York border south of Montreal, through to Parry Sound on Georgian Bay, the Canada Atlantic was built as a logging railway and to portage upper lake traffic overland to New York markets. As a lumber carrier, the railway succeeded. However, it had not much more success at portaging freight than the earlier Northern Railway or Buffalo and Lake Huron.

In addition to trunk line construction, branch lines were built by all major companies in southwestern Ontario and northward from Lake Ontario. Just as the Guarantee Act of 1849 was a major turning point in railway financing that led to the boom of the 1850's, the Ontario Loan Fund of 1871 provided an important stimulus to the railway boom in Ontario during the 1870's and 1880's. The fund was designed specifically to stimulate construction of branch lines and new lines into unsettled parts of the province. The preamble to the Act stated that it was:

> "Expedient to give aid towards the construction of railways leading to or through sections of the country remote from existing thoroughfares or passing through thinly settled tracks, or leading to the free grant territory or to the inland waters." (2)

A fund of $1,500,000 was established that was to pay out bonuses of two thousand dollars to three thousand dollars per mile of railway constructed.

Several regional companies built extensive branch line networks. In south central Ontario, the Northern Railway, Credit Valley Railway (now part of Canadian Pacific), and Toronto, Grey and Bruce Railway (now part of Canadian Pacific), extended north and west from Toronto. In eastern Ontario, the Midland Railway (now part of Canadian National), created a sizeable branch network.

4.3 Competition:

During the 1870's, railway ownership in Ontario was characterized by several small, independent companies feeding traffic into two major companies, the Grand Trunk and Great Western. This relatively stable and competitive

situation was completely upset in 1880 with incorporation of the Canadian Pacific Railway. Although the Canadian Pacific had been projected, by politicians, as primarily a transcontinental line, businessmen that ran the company realised that an eastern feeder system was necessary to create an assured flow of traffic for the transcontinental line. The Grand Trunk was not oblivious to this threat particularly so since the Canadian Pacific had government backing and presumably an unfair financial advantage. In late 1880, the president of the Grand Trunk wrote to Sir. John A. MacDonald warning that the Grand Trunk and Canadian Pacific interests were in opposition in eastern Canada. At this juncture there seemed little the federal government could have done, even if it had wanted to. Thus the Canadian Pacific and Grand Trunk were joined in a "battle royal" to secure their own interests: the Canadian Pacific trying to build or acquire branch lines; the Grand Trunk trying to thwart Canadian Pacific construction or obtain control of lines before the Canadian Pacific.

Predictably, the Canadian Pacific acted first. Originally the Canadian Pacific eastern terminus was to have been at Callander, near North Bay. The company would have connected at that location with a branch of the Northern Railway. In 1881, the Canadian Pacific acquired the Canada Central, extending the eastern terminus of the transcontinental railway to Ottawa. The following year, the company purchased the western half of the Quebec, Montreal, Ottawa and Occidental, further extending the eastern terminus to Montreal. Neither of these acquisitions competed directly with the Grand Trunk but they indicated the aggressive spirit of the Canadian Pacific management not to be content to have their traffic delivered to them in northern Ontario.

The first major casualty of the conflict between the Canadian Pacific and Grand Trunk was amalgamation of the Great Western with the Grand Trunk. Grand Trunk management was particularly worried that the Great Western and Canadian Pacific could join forces. The Grand Trunk apparently engineered an amalgamation using shareholders of the Great Western and successfuly absorbed the Great Western in April, 1882. Later, the Grand Trunk also acquired the Midland Railway and Northern Railway systems.

Most of the Canadian Pacific's lines in Ontario were acquired through construction. In the early 1880's

associates of the Canadian Pacific management revived a dormant charter called the Ontario and Quebec Railway, and used this company as the main instrument for building and acquiring railways in Ontario. Under this charter, a trunk line was constructed by the Canadian Pacific between Montreal and Toronto. Among the regional railway companies acquired by the Canadian Pacific were the Toronto, Grey and Bruce Railway in 1883, and the Credit Valley Railway in 1884. By 1890, the Canadian Pacific's Ontario network was almost complete.

4.4 Border Crossing Structures:

All border crossings with American railways occur over water, resulting in several impressive railway structures connecting Canadian and American companies. The earliest permanent connection with American railways opened in 1855 when the Great Western completed a suspension bridge across the Niagara River. Suspension bridges are not suitable for railway use and this was the only steam railway suspension bridge built in North America. Another outstanding bridge was the New York Central cantilever bridge, also across the Niagara River, completed in 1883.

The Grand Trunk had relied on train ferries to convey cars between Sarnia and Port Huron. With increase in traffic, delays began to develop in the ferry service. As a result a tunnel, completed in 1891, was dug under the St. Clair River. At the Niagara frontier, a similar train ferry operated until the Grand Trunk completed a bridge in 1873, known as the International Bridge, to relieve congestion on this route. At Windsor, both the Grand Trunk and the New York Central continued to use train ferries.

4.5 Narrow Gauge Railways:

Just as the 1850's railway era had produced broad gauge railways, so the 1870's seemed to indicate a narrow-gauge railway fad was developing. Promoters sought a cheap method of providing rail facilities to regions that could not afford standard gauge lines. Narrow gauge railways, usually 0.914 meters or 1.067 meters as opposed to the standard 1.435 meters, could be built more cheaply than a standard gauge railway: they required less land for station grounds, yards, rights-of-way, they could use lighter rails and engineering costs were less because bridges, embankments and tunnels could be narrower and track curves sharper. When one remembers that the 1,000 kilometer system of the

Canadian National Railways in Newfoundland is still 1.067 meter gauge in the 1980's, one can appreciate that a narrow gauge railway was neither an interim nor an uneconomical concept. As long as interchange of freight cars between companies was unimportant, narrow gauge railways could play a useful role in a developing region. However, only two narrow gauge lines were built in Ontario; the Toronto, Grey and Bruce, and the Toronto and Nipissing (now part of Canadian National). The convenience of freely interchanging cars between companies soon became overwhelming, far outweighing advantages of cheaper construction.

4.6 End of Second Railway Era:

The second railway era slid to a halt soon after 1884, the year that a general business recession hit Canada. Like the previous construction era of the 1850's, southern Ontario, at least, had an adequate railway network. No settled areas of the province were more than thirty kilometers from a railway station.

5. Third Railway Construction Era

5.1 Early History:

The late 1890's saw the start of a third railway construction era in Ontario. Unlike the previous two periods of railway development in Ontario, the third phase did not add substantially to serving newly settled regions in southern Ontario. Rather, the period was characterised by increased capacity of existing routes and greater competition among companies. Most new railway construction took place in northern Ontario where several lines were built to tap natural resources and encourage settlement. The main incentive for this railway boom was rapid growth of settlement in western Canada and attendant economic prosperity in Canada. As prairie lands were settled, there was an increased demand in transport services to eastern Canada.

5.2 Transcontinental Railways:

By the end of the nineteenth century it was apparent that the Canadian Pacific would not be able to handle the anticipated increase in traffic. Two companies were clamouring to build new transcontinental railways. The Canadian Northern (now part of Canadian National), a prairie company, wanted to expand into eastern Canada. The Grand Trunk, an eastern railway, wanted to establish a prairie network. The logical approach would have been for these two companies to form a joint working arrangement. But in the golden years of the early twentieth century it seemed like Canada could not get enough railway lines and neither company was willing to compromise with the other. In 1903, the federal government tacitly acknowledged that two transcontinental railways would be built by agreeing to provide aid to both companies.

The Canadian Northern route left Manitoba south of the Lake of the Woods and ran for a short distance through Minnesota before entering Ontario. The line went through Port Arthur (now Thunder Bay), and north around Lake Superior to North Bay before spliting with one line continuing to Ottawa and another to Toronto. To provide an eastern feeder network, the Canadian Northern had to scramble to acquire the few remaining unaligned railway companies in Ontario. The Central Counties Railway from Picton northward to mining areas in central Ontario was one of the few branches the Canadian Northern secured. Most of its branch

line trackage had to be built as new lines. But, before the Canadian Northern could complete construction in Ontario, World War One intervened and brought all development projects to a halt.

Unlike the Canadian Northern, the Grand Trunk's transcontinental network did not begin until Winnipeg. A subsidiary company was incorporated, the Grand Trunk Pacific, to build a line from Winnipeg to the Pacific. The Grand Trunk recognised that the connecting link in Ontario would be unprofitable and was unwilling to undertake construction of this line. As a compromise, the Dominion Government undertook construction of a railway through Ontario and Quebec under the name National Transcontinental Railway. On completion, the railway would be leased to the Grand Trunk Pacific to operate. The route of the National Transcontinental Railway followed the most direct path from Winnipeg to Quebec and ultimately to the Atlantic coast. Thus the railway became the most northerly route of the three transcontinental lines and was built almost entirely through unsettled territory. In order to connect with the parent Grand Trunk in southern Ontario, running rights were obtained over the Temiskaming and Northern Ontario Railway (now Ontario Northland), between North Bay and Cochrane. As with the Canadian Northern, the National Transcontinental project was not completed by the time World War One broke out.

5.3 Railways in Northern Ontario:

Northern Ontario was perceived as the land of opportunity for twentieth century Ontario. A great clay belt around Cochrane promised to be a new agricultural frontier. Lignite deposits seemed to suggest that Ontario might be able to become less dependent on imported fuel. Most promising of all were mineral deposits such as nickel at Sudbury and iron north of Sault Ste. Marie.

Since private companies did not seem inclined to push lines into northern Ontario, the Ontario Government undertook to construct a developmental railway running northward from North Bay. The principal objective of this line was to stimulate settlement on the clay belts around Cochrane. The Temiskaming and Northern Ontario Railway, as Ontario's railway was known, reached Cobalt in 1905, in time to provide a shipping service for recently discovered gold and silver deposits around Cobalt. Slowly the line was pushed northward until Cochrane was reached in 1908.

For the moment, this was the end of track and an extention to James Bay was temporarily postponed.

The other northern railway in Ontario was grandly known as the Algoma Central and Hudson Bay Railway. As its corporate name betrays, this company had aspirations of reaching a salt water terminal on Hudson Bay. The railway initially began as a link between iron mines at Michipicoten and a steel producing complex at Sault Ste. Marie. The railway extended northward, opening vast timber potentials, until construction ceased at Hearst on the National Transcontinental Railway, in 1913. In 1965, the name of the railroad was shortened to the Algoma Central Railway in belated recognition that Hudson Bay would never be reached.

5.4 Railways in Southern Ontario:

Throughout southern Ontario, most construction simply strengthened the competative position of major companies. The Canadian Pacific built a new main line from Toronto to Glen Tay near Smith Falls to provide faster Montreal to Toronto service. Similarly, the Canadian Northern built a trunk line between Ottawa and Toronto. Between Belleville and Toronto three trunk rail lines; the Grand Trunk, Canadian Pacific, and Canadian Northern, operated within a few kilometers of one another.

Both the Canadian Pacific and the Grand Trunk undertook additional construction to improve services or operating conditions. For example, the Canadian Pacific completed a branch to Goderich and Listowel. The company, tired of relying on Grand Trunk connections between Toronto and North Bay, finished its own line between Toronto and Sudbury in 1908.

A local line in southwestern Ontario, the Lake Erie and Detroit River Railway, was acquired by a larger Michigan company, the Pere Marquette Railway (both now part of Chesapeake and Ohio), in 1903 in a move to expand eastward into the lucrative New York State market. The Pere Marquette constructed a line from Blenheim to St. Thomas, parallel to the New York Central and separated by only a few hundred meters. Originally track was to be extended through to Fort Erie for a direct connection to American railways. Fortunately calmer minds prevailed and further wasteful duplication was avoided. Running

rights were obtained over the New York Central from St. Thomas to Fort Erie.

5.5 Double Track:

New lines might serve more territory, but old lines had to be upgraded to meet increased traffic. Both the Grand Trunk and Canadian Pacific undertook large-scale double tracking programmes in Ontario at the turn of the century. The first long section of double track in Canada had actually been completed twenty years earlier in 1874, by the Great Western between Glencoe and Windsor. But Canadian railways were slow to add second track to their main line. The Grand Trunk began double tracking its Toronto to Montreal main line in 1888 but did not complete this work until 1903. The line from Toronto to Sarnia was not finished until 1905. The Canadian Pacific concentrated its double tracking efforts between Perth and Montreal, completed 1908; Toronto to Guelph Junction, completed 1913; and Fort William (now Thunder Bay) to Winnipeg, completed 1909. As well the company undertook long sections of double track work along Lake Superior between Fort William and Sudbury. The only other major double tracking work in Ontario was undertaken by the New York Central along the entire route of its subsidiary, the Canada Southern, between Fort Erie and Windsor.

5.6 Interurban Railways:

While steam railways were improving their property, a totally new railway industry emerged at the beginning of the century. Electricity, the new source of power that would revolutionize industrial activity, was first used to power a railway vehicle in 1879. Engineers quickly showed that self-propelled, electric railway cars could provide fast, frequent passenger service. By 1900, the interurban industry, or radial railways as they were known in Ontario, was established. Promoters envisioned a network of connecting electric railways providing fast passenger service throughout the southern part of the province. Several lines were built, the Lake Erie and Northern, the Chatham, Wallaceburg and Lake Erie, and the Nipissing Central, to name a few. As well, the former steam railway, the London and Port Stanley Railway was converted to electric interurban operation. Ontario Hydro became interested in interurban railway promotion, both acquiring several companies and projecting many new ones. By 1915 several hundred kilometers of interurban railways operated in Ontario.

Unfortunately for the industry, its popularity peaked just at the beginning of the automobile era. Throughout the 1920's passenger traffic was eroded in face of automobile competition. The 1930's depression finally killed off most of the lines. A few struggled on as freight routes but the interurban era effectively ended in the depression.

5.7 Steam Railway Electrification:

Electricity also found application in the steam railway industry. In October 1904, a freight train broke down while passing through the St. Clair tunnel at Sarnia. Before repairs could be made, six men were asphyxiated by locomotive smoke. This accident pointed out the danger of operating steam locomotives in tunnels. Accordingly, a contract was let to electrify tunnel operation and electric locomotive service began in the spring of 1908. The New York Central, similarly, electrified its tunnel between Windsor and Detroit. After railways were dieselized in the 1950's and 1960's, smoke was no longer a problem in tunnels. Thus both of these tunnels have been de-electrified and diesel trains run exclusively.

5.8 Train Ferries:

For decades, train ferries had operated across the St. Lawrence, Niagara, St. Clair, and Detroit Rivers, ferrying cars between companies. In some cases, when traffic became too great, bridges or tunnels replaced ferry service. River ferries continue to operate today between Sarnia and Port Huron and Windsor and Detroit.

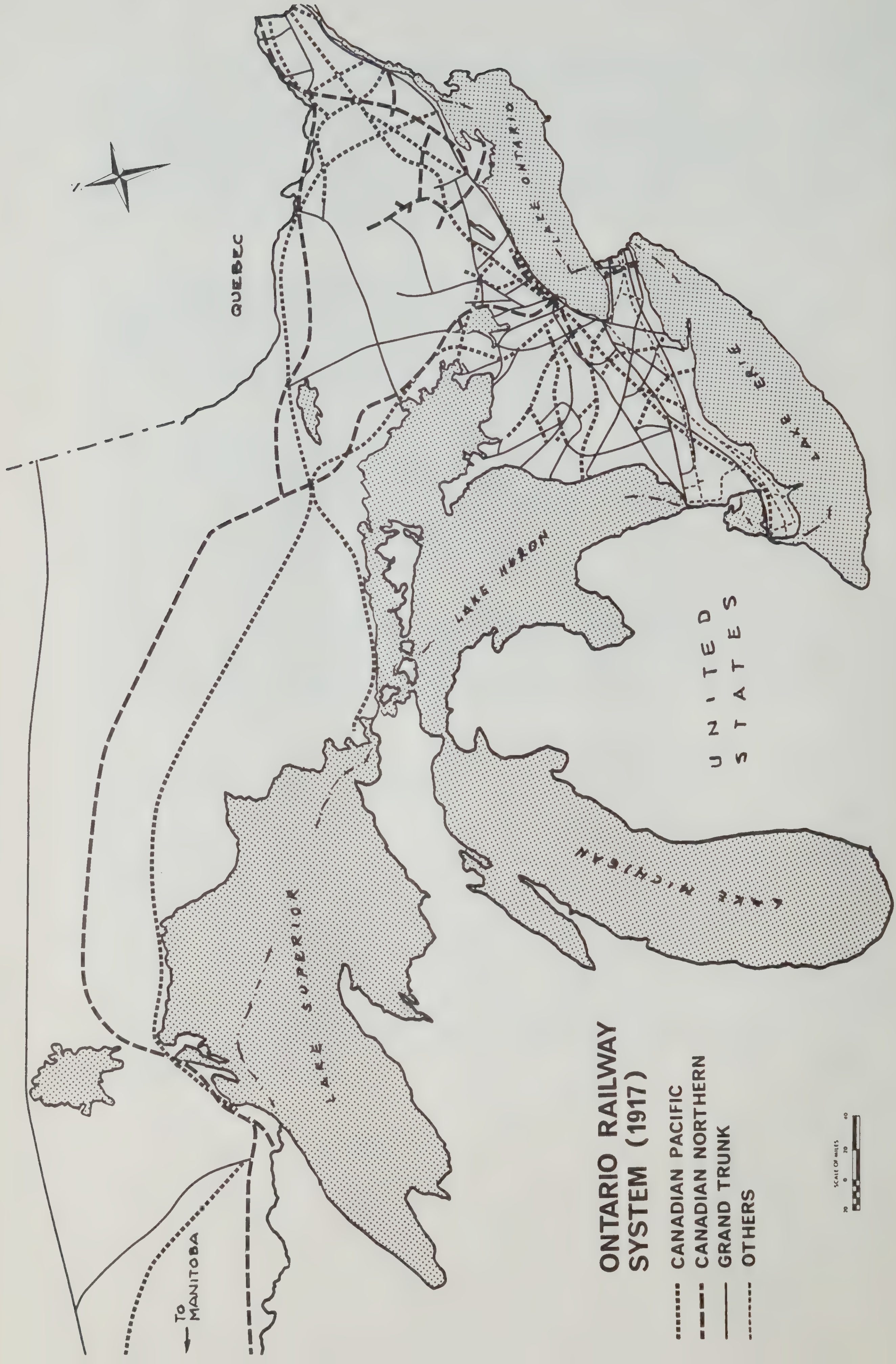
The first ferry service on the Great Lakes between the United States and Canada occurred on Lake Erie in 1895. A train ferry service began between Port Dover and Conneaut, Ohio. Unlike the river ferries which were built to overcome natural obstacles, the Great Lake ferries were a convenience service. Most coal burned by the railways and industries of Ontario came from Pennsylvanian coal fields south of Lake Erie. Railway ferries offered a short-cut for this north bound traffic. Altogether five ferry routes operated on Lake Erie at various times and one on Lake Ontario. Although successful for a number of years, decline in rail traffic during the depression ended most ferry operations. Only one Canadian Great Lake ferry is in operation in the 1980's. A Canadian Pacific subsidiary runs a train ferry between Thunder Bay and Superior, Wisconsin, on Lake Superior.

5.9 End of Third Railway Era:

World War One brought a sudden end to the third railway era. As the carnage in western Europe mounted, the Canadian Pacific suspended its double tracking program, and the Canadian Northern shelved plans to construct branch lines in southern Ontario. With shortages of men, materials, and money, companies could only wait to see what the future would hold.

During the Halcyon years of the early 1900's, continual economic growth seemed assured. New railways were built with expectations of future traffic rather than to meet existing demands of the country. But three trans-continental lines and numerous branch lines were far more than the country required or reasonably could expect to need for the forseeable future.

A short, sharp depression in 1913 provided the first indication that economic growth was not going to be infinite. The following year, the outbreak of war in Europe became a cataclysm that completely upset all economic forcast. World War One placed both the Canadian Northern and the Grand Trunk in particularly vulnerable positions. The Canadian Northern completed its transcontinental line just prior to outbreak of war. But neither the main line nor eastern network were in a finished state to handle war traffic impossed upon them. The National Transcontinental was not opened until 1915. The National Transcontinental - Grand Trunk Pacific, faced similar problems to the Canadian Northern of operating an unfinished system during the war.


QUEBEC
LAKE ONTARIO
LAKE ERIE
LAKE HURON
UNITED STATES
LAKE MICHIGAN
LAKE SUPERIOR
TO MANITOBA
ONTARIO RAILWAY SYSTEM (1917)
CANADIAN PACIFIC
CANADIAN NORTHERN
GRAND TRUNK
OTHERS

6. World War One to Present

6.1 Creation of Canadian National:

Economic uncertainties created by the war, heightened problems of the two new transcontinental railways that had been overlooked in more prosperous times. In expectation of future traffic, the companies had financially over-extended themselves. World War One drove both companies to the brink of bankruptcy. The federal government, as the principal creditor, had too large an investment in the Grand Trunk Pacific and the Canadian Northern to allow either of these railways to slip into bankruptcy. As well, bankruptcies of such magnitude would be harmful to the war effort and reflect poorly on the Canadian business community in international finance. The federal government had little option but to absorb the ailing lines.

Acquiring railways that ultimately led to the formation of the Canadian National began when the Grand Trunk Pacific announced that it would not lease the National Transcontinental as previously agreed. Therefore the Canadian government was compelled to operating the National Transcontinental once completed. Then the government took over the Canadian Northern in 1917 to prevent the line from defaulting on security payments. Two years later, in 1919, the Grand Trunk Pacific, due to its financial insecurity, was also forced to joining the Canadian National. Finally in 1923, the Grand Trunk Railway, the parent of the Grand Trunk Pacific was acquired by the federal government. These companies were grouped with the Canadian Government Railway, the government railway that operated lines in the Maritime provinces. The term "Canadian National Railways" was first used descriptively in 1918 and formally incorporated the following year.

Amalgamating these diverse companies created numerous operational problems. Three formerly independent railway companies were now expected to operate efficiently as one company. New track had to be constructed to connect previously independent main lines to produce integrated trunk line routes. For example, in Northern Ontario, a short-cut-off was built between Nakina and Longlac joining the Canadian Northern and the National Transcontinental. Canadian National's new trunk line was now composed of the former Canadian Northern line

from Toronto to Nakina and the former National Transcontinental from Nakina to Winnipeg. The National Transcontinental line from Nakina to Quebec and the Canadian Northern line from Longlac to Thunder Bay became of secondary importance. All former Canadian Northern track between Toronto and Belleville was gradually abandoned over a ten year period and the Grand Trunk main line between Toronto and Montreal retained as the principal trunk route.

Despite World War One and subsequent creation of the Canadian National, the Canadian Pacific remained a well managed company. Although the company had expanded its network in Western Canada, the Canadian Pacific had ample resources to meet the strain of wartime transportation. During the organization of the Canadian National, the Canadian Pacific had in fact offered to purchase sections of former Canadian Northern and Grand Trunk trackage but the resulting monopoly was politically unacceptable to the country.

6.2 Competition - Between Railways:

The 1920's became a period of growing competition between the Canadian National and Canadian Pacific. Much of this activity was initiated by the Canadian National but was not justified by the level of traffic or earning conditions of the period. The two companies vied for coastal steamer services, new hotels, and luxurious passenger services.

> "These wasteful practices extended to house delivery of tickets, the multiplication of city ticket offices, to radio activities, costly advertising, and the establishment of a standard of passenger travel quite beyond the requirements of the country." (3)

This extravagant competition ceased during the Depression.

6.3 Competition - Road Traffic:

As the federal government agonized over the creation and management of the Canadian National during the 1920's, a much greater and more lasting force was beginning to affect the railway industry. Motor vehicles had been increasing in popularity for the past twenty years and by 1930 had evolved from a plaything of the rich

to a viable transportation mode.

Motor vehicle registrations in Canada grew from 2,130 in 1907 to 585,050 in 1923 and 1,250,000 in 1930. Complimenting the greater number of motor vehicles were improved road conditions in Ontario. All-weather roads soon reached many communities of southern Ontario, increasing the potential of motor vehicle transportation.

Road traffic posed a serious economic threat to railways. Apart from rails advantages of speed and economic handling of bulk commodities, automobiles and trucks could carry freight and passengers with more flexibility of route and schedules than railways. By the early 1930's the railway industry recognized that decline in passenger traffic was permanent. Trucks offered door to door service rather than station to station service of rail lines. An indication of the popularity of trucks can be seen in the growth of truck registration in Canada from 54,000 in 1923 to 165,000 in 1930. However, many people within the railway industry thought that trucks would act primarily as collector and distribution systems for railways and not exceed operating radii of 80 kilometers. Improvements in both trucks and roads soon permitted trucks to compete with railways on many line haul routes.

Frequently, growth of road transportation has been viewed as corresponding to a decline in railway transportation. And, in fact, the railway industry lost much of its passenger traffic, less than carload freight, and high value freight, such as mail, to the automobile, bus and truck. Nevertheless, through this period the railway industry has remained viable and the traffic carried today is far greater than ever before.

6.4 Modernization:

Rather than a period of decline, the railway industry between 1920 and approximately 1970, underwent a period of market share redistribution. From a monopolistic transport industry, the railway evolved into a service for specific sectors of the transportation market. Thus what the railway lost in passenger and less-than-carload freight was more than compensated for by increases in freight traffic in other areas. As a result, railways are entering the 1980's in a prosperous form indicating that redistribution within the total transport industry may finally have stabilised. The Canadian National Railways has earned

a profit for several years in a row and new freight traffic is being continually attracted to railways.

Modern stability in the railway industry was not achieved without some wrenching changes in the organization and physical structure of the railway. Perhaps the most profound change in modernization has been dieselization.

6.41 Dieselization:

Dieselization of Canadian railways between 1950 and 1960 wrought an emotional and social change within the industry and society. Gone was the steam, motion, smell, and whistles that gave so much romance to the railway industry. Gone also, was the smoke and cinders that most romantics tend to overlook. But most seriously was also lost the livelihood of many small railway towns that relied on servicing the locomotive. Steam locomotives required periodic maintenance and supply, much more than the replacement diesels. In isolated parts of Ontario, towns like Nakina and Sioux Lookout were established principally for servicing steam locomotives. Major repair work provided business for larger towns such as Stratford and St. Thomas. Diesels were much more modest in their maintenance requirements than steam locomotives, thus adding to their efficiency and economical operation. In a period of increasing competition within the transportation market, diesels provided an option for higher productivity of railway operation. However, with dieselization came redundancy of most service facilities. This required considerable readjustments by the communities affected. Some towns, like Nakina, declined while others like Stratford successfully transferred to other industrial activities.

6.42 Branch Lines:

When railways provided the only economic means of transportation, a network of branch lines extended away from trunk routes to serve rural communities. In settled regions of Ontario no district was more than twenty to thirty kilometers from a station. Once automobiles and trucks became common, there was little need for such a dense rail network. Consequently, branch line networks that had been so vital, became unnecessary. Surprisingly, there has been little rail abandonment in Ontario. Most lines still exist, although under-utilised. Most of those lines that have disappeared, tended to be interurban railways and cross country routes that did not serve modern rail needs.

Hence, for example, the line from Port Dover to Stratford has been removed. The line cut across several trunk routes but most of the traffic that originated along the line was captured by truck competition. Another line, the Canadian Pacific from Glen Tay to Havelock had once been a major trunk route. Later this line was replaced by a new track along the shore of Lake Ontario reducing the Glen Tay to Havelock line to branch line status. As branch line traffic declined there was no justification to maintain the route and it was abandoned in 1971. Changing traffic patterns also eventually led to the abandonment of most of the former Canada Atlantic Railway (now part of Canadian National). This railway had built a combination logging and trunk route between Georgian Bay and the New York border near Montreal. By the 1960's both logging and through traffic had declined and the railway was gradually abandoned in stages over a twenty year period.

6.43 Station Abandonment:

In conjunction with decline of branch lines has been the closing of hundreds of railway stations throughout the province. The end of short haul passenger and express traffic and less-than-carload freight has made local railway agents unnecessary. Formerly, railway agents were the local business representatives of railway companies. The agent handled the myriad freight and passenger transactions that took place in the average community. Today, industries requiring freight service contact centralised "carload centers" that both major railways, the Canadian National and Canadian Pacific, maintain throughout the province. With no need to have agents in each station, the buildings have become obsolete. Most stations, once the pride and architechtural joy of small towns, have now disappeared or been converted to new uses such as museums, cottages, or community centers.

6.44 Increasing Capacity:

Countering decline in branch line traffic, has been great increases in freight carried on trunk line routes. Railways have concentrated their marketing efforts on what the modern railway can do best--carrying heavy loads between intercity terminals. Welded rail, centralised traffic control, signalling, improvements in track alignment and construction of new yards have helped increase freight capacity. Growth of freight traffic on the Canadian National and Canadian Pacific has been as follows:

REVENUE FREIGHT CARRIED (4)

TONS ('000)

YEAR	C.N.	C.P.
1925	54,999	32,969
1935	38,808	26,094
1945	79,941	54,822
1955	87,607	58,489
1965	99,205	67,411
1975	112,085	84,702

6.45 New Track:

Not surprisingly, little rail construction has taken place since the 1920's in Ontario. The longest track to be completed was the Temiskaming and Northern Ontario (now the Ontario Northland) to James Bay. Moosonee had originally been intended as a salt water port for Ontario. By the 1930's this was no longer a justification for building a railway. However, it was completed to Moosonee as a make-work project during the Depression and to provide rail access to hydro dam construction on the Abitibi River. Other railway construction in Ontario has been limited mainly to mining and industrial spurs. Such were the cases in the Canadian National and Canadian Pacific lines to Manitouwadge and the Canadian National lines to Nanticoke, Douglas Point nuclear reactor station, and Bruce Lake. New lines may be built in the future for similar purposes but the era of trunk line and branch line construction in Ontario is over.

6.5 Government of Ontario Transit (GO)

Even before the energy problems of the 1970's, some Toronto planners perceived that more freeway construction could not satisfy all new urban transit requirements. From numerous studies, beginning in 1963, evolved a new commuter rail service known as Government of Ontario Transit, or GO Transit. In May 1967, commuter trains began operating between Hamilton and Pickering, through Toronto Union Station. The system was subsequently expanded to include three rail routes and several connecting bus operations. Both bus and rail systems are owned by the Government of Ontario with the rail operation run under contract by Canadian National.

A convincing argument for creating GO Transit was the long term savings in the cost of highway construction

in the Metro Toronto area. In 1967 dollars, the capital investment in GO Transit was $15 million while a six lane expressway would have cost approximately $4 million per mile. Initially the rail system was designed to carry 15,000 passengers per day. By 1980, daily rail patronage had reached approximately 42,000 commuters, a profound indication of the success of GO Transit.

6.6 The Future:

The railway industry in Ontario, and indeed all of Canada, is entering the 1980's in a strong economic condition with a promising future. The previous fifty to sixty years were not easy on the industry and at times it seemed uncertain in which direction the railway industry was evolving. But the companies surmounted debilitating inter-rail competition, excess rail capacity of the early twentieth century, and competition from new modes of transportation. As a result of road competition, the railway today is a radically modified transportation service. From a monopolistic position, carrying any freight and passenger traffic offered, modern railways are specialised carriers primarily of bulk freight. In the process of adjusting to road competition, railways have modernized track, equipment, and procedures to maintain an economic and efficient transportation mode.

The strong position of railways today is enhanced by their superior energy efficiency compared with road transport. If energy continues to be a problem, and there is every indication that it will get worse rather than better, and if government policy favours rail transport as a significant part of an integrated transportation system, then the railway industry may indeed look forward to a renaissance.

FOOTNOTES

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LAND USE IMPACTS

June 23, 1980

RAILWAYS AND THE NATURAL ENVIRONMENT

A Report
prepared for the
Ontario Task Force on Provincial Rail Policy
by the
Land Use Co-ordination and Special Studies Section,
Environmental Approvals Branch,
Ministry of the Environment.

CONTENTS

1. INTRODUCTION

The purpose of this paper is to provide a general understanding of the environmental effects associated with railway operations on the natural environment and to determine the role of the Province in minimizing any such adverse environmental effects.

The report examines the various environmental effects resulting from all types of railway operations in the non-urban environment, as well as outlining common measures for mitigating impacts. Environmental aspects involve: water quality, water quantity, noise and vibration, dust, odour, particulates, fuel emissions, pesticides, solid waste, incompatible uses and hazardous substance spills.

The report first examines the environmental legislation and programs at the disposal of the Ministry of the Environment, applicable to railways.

2. MINISTRY OF THE ENVIRONMENT INVOLVEMENT IN RAILWAY OPERATIONS

The involvement of the Ontario Ministry of the Environment in regulating railway operations at the source of emissions is essentially limited to the environmental assessment of urban transit systems, under The Environmental Assessment Act. An example is the GO Transit System for the Toronto Area Transit Operating Authority (TATOA). Large railway operations, such as Federal Crown Corporations like CNR, and large private, interprovincial railways like CPR are under the jurisdiction of Federal authorities.

The Ministry of the Environment is commonly involved under The Environmental Protection Act (EPA) in the abatement of adverse off-site effects, such as noise and the containment and clean-up of contaminant spills as they affect nearby lands and waters. The Ministry is also involved in such peripheral activities as: licensing of applicators of pesticides and herbicides on railway rights-of-way under The Pesticides Act to ensure that only environmentally-safe chemicals are sprayed;

and, approving solid and liquid industrial waste sites, under The EPA, and sewage and water servicing systems, used in railway operations, under The Ontario Water Resources Act (OWRA). Air quality criteria are established by regulation under The EPA and Provincial Water Quality Objectives and Water Management Policies are established under The OWRA.

The Ministry of the Environment has had experience in analyzing the environmental effects of other types of linear facilities, such as sewer and water mains, which come directly under the jurisdiction of the Ministry. Therefore, MOE can also offer advice on such matters as: environmental inventory factors[15] and assessment and mitigation procedures[16] to consider in the selection of routes and sites for new linear facilities and ancillary uses; environmentally-sound construction practices[11]; and, the use of on-site environmental inspectors and follow-up environmental monitoring procedures to ensure compliance with environmental objectives.

A general list of environmental factors and mitigation measures for general construction and operation activities for linear facilities is outlined in the Appendix. A process of environmental assessment that would ensure that necessary environmental safeguards are considered and incorporated into a railway operation at an early stage in the planning and implemented, is also included in the Appendix.

3. ENVIRONMENTAL EFFECTS

The rail mode of transportation is a relatively small contributor to pollution, especially with respect to gaseous emissions. A recent U.S. study[10] estimated that railroad emissions in that country were responsible for only about 1% of total national air-pollutant emissions.

The following section highlights some of the environmental concerns associated with general rail operations as indicated in the literature[1,10]. Where appropriate, significant environmental effects of railway electrification and abandonment are also mentioned.

a) Water

i) Water Quality

Liquid pollution from normal operations can occur from loss of cooling water, fuel spillage during re-fueling operations and most importantly, washings from tank car cleaning operations. Most chemical additives in drained or leaking radiator water, such as sodium chromate or caustic solutions, are usually disposed of by planned liquid waste disposal through sewage treatment plants or contractor disposal. Fuel - oil spillage occurs mainly at shops, terminals and fueling stations although most new terminals have concrete service platforms, catchbasins and connected sewer systems. There is also a need to treat runoff water containing fuel and lubricants at railyards, terminals and similar facilities as well as washwater and detergents from steam cleaning operations. Treatment was largely neglected in the past.

The major negative effect resulting from railway upgrading operations or the construction of new rail lines is the amount of disturbance along the rights-of-way and the large numbers of new ties installed. Creosote, a preservative used on railroad ties, can leach from new ties into nearby waterways. Painting of bridges and upgrading and maintenance may also present a water quality problem depending upon size, depth and rate of flow of the watercourse. The upgrading of foundations with slag, over which wooden ties are placed, could contain heavy metals, making it another water quality consideration.

As woodlots and wetlands also provide a significant role in water quality and quantity control, their destruction with the construction of new or upgraded rail lines or facilities, should be minimized with proper planning and design.

ii) Water Quantity

Because of the value of woodlots and wetlands in some cases for groundwater recharge, these natural features should be avoided as much as possible in the planning and design of new rail facilities.

Natural and artificial drainage in the rural and natural environments should also be maintained as much as possible such that rates and volumes of storm water do not substantially increase, and the groundwater is recharged. The disruption of agricultural drains and tile drainage systems should be avoided. Provisions should be made for anticipated draw-down or lowering of groundwater during construction. The adverse effects on upstream uses located in and near the floodplain caused by increased back-wash during flooding occurrences should be considered in planning railway facilities over a watercourse.

b) Air

i) Noise and Vibration

Sound levels from freight trains and trucks are similar and are usually in the 75-100 dBA range[10]. Rail road noise can be put into two categories: main line noise and yard noise. Noise would have an obvious adverse effect on farm or non-farm residents living between a thousand feet and one-half mile away from rail lines or yards. No information is available on the adverse effects that noise from train movements can have on livestock operations.

One possible adverse effect of rail line abandonment is an increase in the number of motor trucks used to make up any extra movement of goods or services previously carried by rail. Therefore, increased noise could be generated in the immediate area of the abandoned rail heads and in the area of freight transfer terminals. Another indirect effect of rail line abandonment could be the use of rights-of-way by other noise-generating uses, such as motorized recreational vehicles, motorcycles and all terrain vehicles.

Noise impacts resulting from electrification are generally considered positive as the characteristic noise of the diesel locomotive is eliminated.

ii) Fuel Emissions, Particulates and Odours

Diesel engine emissions are typically low in hydrocarbons and relatively high in nitrogen oxides.

Railyards are generally regarded as sources of particulate air pollutants. Material blows from open cars, engines emit smoke, and near the yards there are often industries which produce particulate emissions. Dust generated during construction of new lines or rail yards is only a minor, temporary problem that can be resolved through good construction practices.

Odours, mainly from diesel emissions, can be annoying to persons living near railyards. There are also some smelly lubricating oil particles that can occur from diesel exhausts that could be minimized by better design and maintenance to minimize leakage and friction.

By removing a line from service, the air pollution that the locomotive will produce from travelling along that line is eliminated, but the net effect can only be determined by the type of use that would replace the railway. For instance, the

use of a right-of-way for recreation and conservation or as a utility corridor would have virtually no air pollutant emissions. Limited motorcycling and snowmobiling would produce some air pollutants. A highway would emit even more.

From an air pollution point of view, the principal difference resulting from electrification of a rail line is that the pollution source is no longer mobile and could improve air quality in the area around the rail line. However, the degree of impact depends on whether the power plant used to generate the electricity is located near a highly populated area and the extent to which power plant emissions, containing sulphur oxides and particulates, are controlled.

iii) Pesticides

Rail roads use snow ploughs instead of salt to control snow and ice, but other types of chemicals such as herbicides are used to control the growth of vegetation along rights-of-way for both safety and aesthetic reasons in line maintenance. Some leaching of these herbicides and defoliants can occur and cause water quality problems. Herbicides applied without regard to the properties of the chemical, the meteorological conditions, and the surrounding populace can also create air pollution problems just as great as open burning.

The use of an abandoned right-of-way subsequent to discontinuing rail service to something other than another transportation mode would likely have a positive effect on the air pollution problem caused by normal line maintenance, as such maintenance practices as herbicide sprayings would be reduced.

c) Land

i) Solid Waste

Private citizens and companies discharge wastes onto railway rights-of-way, particularly in older, built-up areas. Usually railways collect and dump such trash in order to comply with local zoning by-laws.

Solid waste can be generated from railway operations themselves. Customers receiving shipments by rail are expected to clean the car of bracing material, blocking, metal stripping, paper, grain, etc. Often this is done by the railroad, and is not a big problem.

In the United States, some 70,000 rail freight cars are dismantled every year producing an average of 200,000 tons of wood annually[10]. Open burning of such material can cause environmental impacts from smoke, although a number of scrap dealers have or plan to install smokeless incinerators.

A very positive aspect of railway operations could be their use as an economical and efficient way to transport scrap and abandoned automobiles from the dismantling yard to the scrap processor or steel mill. This would help to solve the logistical problem of getting scrap autos from one place to another. It would assure scrap processors of a dependable supply, and ensure scrap yards with a relatively inexpensive form of transportation.

ii) Inconvenience/Annoyance to Adjacent Land Uses

Short-term inconvenience and annoyance to nearby rural agricultural communities can occur from the normal effects of construction that can cause noise, dust, particulates and possibly groundwater disruption. Such occurrences should be minimized by good planning, design, construction and maintenance procedures.

Noise can also result over a longer period and affect nearby rural uses. This aspect should also be considered in the early stages of planning new rail lines.

d) Hazardous Substance Spills

Rail accidents, including hazardous-material-related accidents, have been projected to increase in the United States as a result of increased train speeds, train sizes and loads without greater improvement in railroad maintenance practices[2].

In the United States, railroads in conjunction with Federal Transportation Safety personnel, shippers' organizations and the Federal Bureau of Explosives have established emergency procedures for dealing with pollution from derailments. The Federal Bureau of Explosives has also produced handbooks for operating personnel to aid them in handling hazardous materials.

Recently in Ontario, a new spills bill was legislated and became law under The Environmental Protection Act. It clearly sets out the framework for determining the rights, responsibilities and liabilities of all parties involved in a spill that affects the environment.

A mechanism is already in place called the Province of Ontario Contingency Plan for Spills of Oil and Other Hazardous Materials that sets out a number of procedures to follow in the containment and clean-up of oil spills and other hazardous substances. The Contingency Plan brings together several federal, provincial and municipal authorities in responding to environmental and environmental health emergencies. The Ministry of the Environment serves as the on-scene co-ordinator for such activities.

There is, however, no preventive mechanism that is considered, beyond good maintenance practices, for reducing the effects of hazardous substance spills from railways. Appropriate set-back distances, for instance, separating residential and other sensitive developments from railways that carry certain hazardous substances, could reduce the risk of such environmental emergencies[17].

The abandonment of the rail mode of transportation would eliminate any adverse effects from possible hazardous substance spills from railroads in the immediate vicinity. Although, the adverse effects of transporting hazardous substances by water or air may be considerably worse, as containment may be more difficult.

4. CONCLUSIONS

- Railway operations are a relatively small contributor to air and water pollution.

- Most of the environmental impacts from railways in the rural, non-urban areas are: either short-term, occurring during construction, and can be mitigated, such as sedimentation of water, dust, and drawdown of groundwater; or, are difficult to mitigate once the planning or design of a railway has been established, such as the adverse effects of noise, the destruction of significant wooded or natural areas or other land use compatibility considerations.

- The most serious and long-term environmental effects appear to be from spills of hazardous substances from trains which tends to be on the increase.

- A federal-provincial mechanism in the form of a Contingency Plan is in place to respond to environmental emergencies from hazardous substance spills, although no preventive strategy for those possibly affected beyond the railway rights-of-way accompanies it. Public authorities are studying the designation of "Hazardous Goods Routes" for transportation routes involved in carrying hazardous substances. Appropriate set-back distances for new residential developments could be considered in proximity to such routes for safety reasons.

- The Ministry of the Environment has limited environmental input on large inter-provincial private and federal railway undertakings and is only able to have direct environmental influence on urban transit systems which are reviewed in an environmental assessment process under The Environmental Assessment Act. A Federal Environmental Assessment and Review Process (EARP) is now used to

comprehensively review significant Federal Government projects, and could also be considered for railway operations.

- Based on experience with other linear facilities, the Ministry of the Environment is able to offer advice and available environmental guidelines on environmental inventory, analysis and mitigation procedures, that may be applicable to railway facilities.

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APPENDIX

APPENDIX

ENVIRONMENTAL CONCERNS AND THEIR TREATMENTS

The following are some typical examples of environmental concerns and their possible treatments. Their purpose is to give an indication of the types of measures that can be taken and their applicability. What actually would be done on any particular project would depend on such things as the effectiveness of the measure, both in engineering and environmental terms, as well as costs.

ENVIRONMENTAL CONCERN	TREATMENT	APPLICABILITY
Natural Drainage and Soils		
Increased sedimentation and turbidity in nearby waterbodies due to construction activities and design requirements	-Hydro mulch -Temporary seeding -Mulch and Crimp -Sodding	During construction on slopes and drainage channels (interim control)
	-Permanent vegetative cover	On final trimmed slopes
	-Sediment traps	Collect sediment either within or before entering drainage channel
	-Rip rap, gabions	On embankments
	-Filter cloth or clay seal with rip rap	On steep drainage channels

ENVIRONMENTAL CONCERN	TREATMENT	APPLICABILITY
	-Staging work	During critical periods
<u>Fisheries</u>		
Increased disruption to fish survival and spawning	-Limit operations to specified periods	Sensitive streams
	-Avoid dewatering directly into sensitive waterbodies	
<u>Vegetation</u>		
Removal of trees, grass, and shrubs	-Replacement of topsoil	Where safety and drainage are to be maintained
	-Refurbish with new plantings or natural regeneration	Erosion control and aesthetics
<u>Aesthetics</u>		
Expansion facilities inconsistent with or disrupt character of area	-Preserve existing amenities as much as possible	As general practice
	-Landscape access points, site periphery and in vicinity of buildings with trees and shrubs	Where suitable

ENVIRONMENTAL CONCERN	TREATMENT	APPLICABILITY
Aesthetics cont'd	-Design and site structures to blend with adjacent building form and materials	
Noise and Vibration		
Increased noise levels from more buses and private vehicles	-Install noise barriers -Use buildings as barriers through site layout planning -Design site and buildings for acoustical performance	Where substantial noise will be experienced in an adjacent residential or institutional area and where substantial attenuation is possible
Increased noise levels during construction	-Limit construction period to day time hours -Utilize special noise reduction equipment on construction machinery	As above
	-Designate routes and parking and waiting areas for construction vehicles	As above and where feasible
Air Pollution		
Dust during construction	-Control dust on site by methods such as watering, etc.	Where adjacent land uses could be adversely affected

ENVIRONMENTAL CONCERN	TREATMENT	APPLICABILITY
Exhaust emmissions from idling vehicles	-Minimize vehicle idling time	Where land uses or natural vegetation could be adversely affected
<u>Temporary-Disruption During Construction</u>		
Inconvenience to users of adjacent properties and buildings	-Notify public agencies and adjacent owners of construction period -Consult with public agency regarding temporary access re-routings -Identify truck routes and truck parking areas to be used during construction	As general practice
	-Identify specific locations for storage of construction materials, soil, etc. on site -Program construction process so as to minimize period of disruption in proximity of adjacent residences or institutional uses	Where substantial inconvenience or disruption to adjacent uses would be experienced and where measures would substantially reduce effects

ENVIRONMENTAL CONCERN	TREATMENT	APPLICABILITY
<u>Pedestrian Movements</u>		
Disruption of access between facility and adjacent community or disruption of other pedestrian linkages in community	-Maintain continuity of pedestrian walkway system as much as possible	As general practice
	-Provision of walkway strips to adjacent residential areas -Provision of cross-walks, sidewalks at access points	Where suitable
<u>Social Disruption</u>		
Removal of residences within expansion areas	-Co-ordinate removal program to minimize inconvenience	As general practice
Community perception of increased vehicular and patron movements	-Traffic control devices -Vehicle routing modifications to minimize disruption to intra-community pedestrian mobility -Landscaping to screen traffic movements in and out of a station	Where suitable

APPENDIX

Content Requirements of The Environmental Assessment Act, Section 5(3)

(3) An environmental assessment submitted to the Minister pursuant to subsection 1 shall consist of:

(a) a description of the purpose of the undertaking;

(b) a description of and a statement of the rationale for,

(i) the undertaking,

(ii) the alternative methods of carrying out the undertaking, and

(iii) the alternatives to the undertaking;

(c) a description of;

(i) the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly,

(ii) the effects that will be caused or that might reasonably be expected to be caused to the environment, and

(iii) the actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment,

by the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking; and

(d) an evaluation of the advantages and disadvantages to the environment of the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking.

Land Use Planning and Railways

A Submission to the Ontario
Task Force on Provincial Rail Policy

Ministry of Housing
Operations Control Branch
June 1980

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

Introduction

The objective of the following report and supporting appendix material is to determine the state-of-the-art of land use planning throughout the province related to railways. In order to accomplish this task, information has been extracted from zoning by-laws, official plans and development proposals that directly or indirectly address the matter of railways.

The review area, as outlined on Figure 1 has been selected for its location along major rail routes. The sample area has been divided into five (5) study areas, namely:

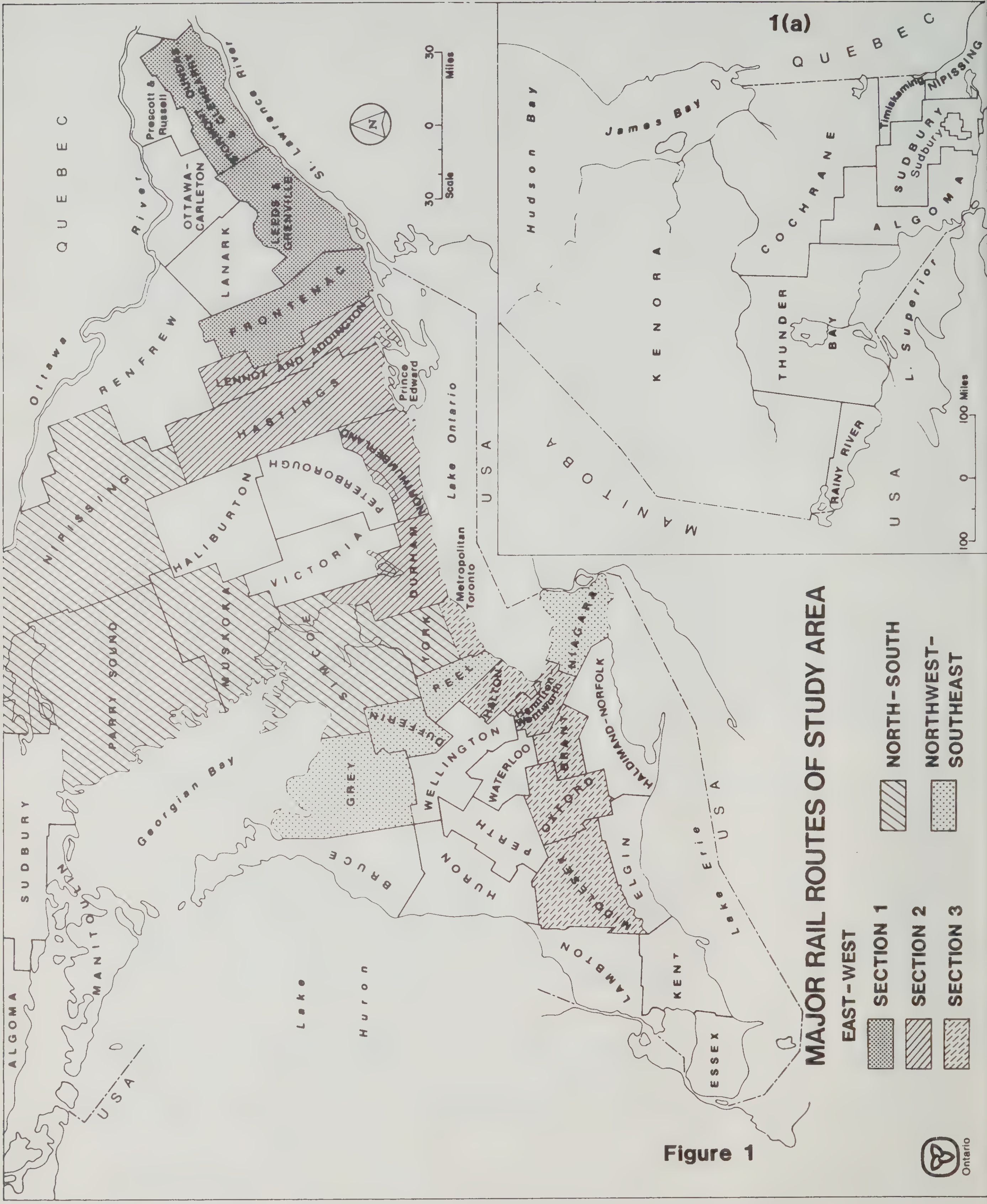
1. the Ontario/Quebec border to Frontenac County
2. Lennox and Addington County to the Regional Municipality of Durham
3. Metropolitan Toronto to Middlesex County*
4. Regional Municipality of York to the District of Nipissing (including selected northern communities)**
5. Regional Municipality of Niagara to Grey County***

(Surveys were also sent to selected municipalities throughout Ontario.)

In addition, the report examines the responses of agencies to development proposals and planning documents affected by railways. The agencies include the Ministry of the Environment, Canadian National Railways, Canadian Pacific Railways.

The information related to land use has been recorded on summary sheets that are contained in this volume. Excerpts from the related documents appear geographically in the ensuing volumes.

* located along the main east/west line
** located along the north/south line
*** located along the northwest/southeast line



MAJOR RAIL ROUTES OF STUDY AREA

Figure 1

2. Overview

2.1 - Official Plans

In general, there are few specific policies related to railways contained in official plans throughout the province. While many official plans contain provisions for buffering between incompatible or conflicting land uses, the majority of documents contain either general statements related to rail or remain silent on the matter.

There are however, some exceptions. Two northern communities - Chapleau and Hornepayne regard the rail lines as an integral component of not only their current but future development. In other parts of the province, official plan policies focus on the preparation of rail transportation strategies and noise and vibration studies.

Land use designations adjacent to railways are primarily "industrial" and "commercial". In communities outside urban areas much of the land is designated either "rural" or "open space". In most cases throughout the study area, a portion of the adjacent land use is designated "residential".

Figures 2 through 6 are examples of official plan schedules from various municipalities located throughout the study area. These particular samples were chosen for three reasons:

1. each planning area is affected by a rail line
2. the land uses shown on the schedules are representative of those that occur throughout municipalities across the province
3. the samples illustrate approaches to land use planning in areas that range from "metropolitan" in complexity to municipalities located within a rural context

Figure 2 describes general land use in the City of Toronto. In this example, it is apparent that the railway has had a significant impact on the surrounding land use.

The City of Kingston (figure 3) is an example of "traditional" development within an urban centre. The geographic location, economic and historic basis of the city have encouraged industrial development to locate adjacent to the major east/west rail line.

The remaining figures (4-6) illustrate the distribution of land use adjacent to rail outside the province's major urban centres (includes information related to the Central Northumberland Planning Area, Village of Markdale and the Lefroy community).

3(c)

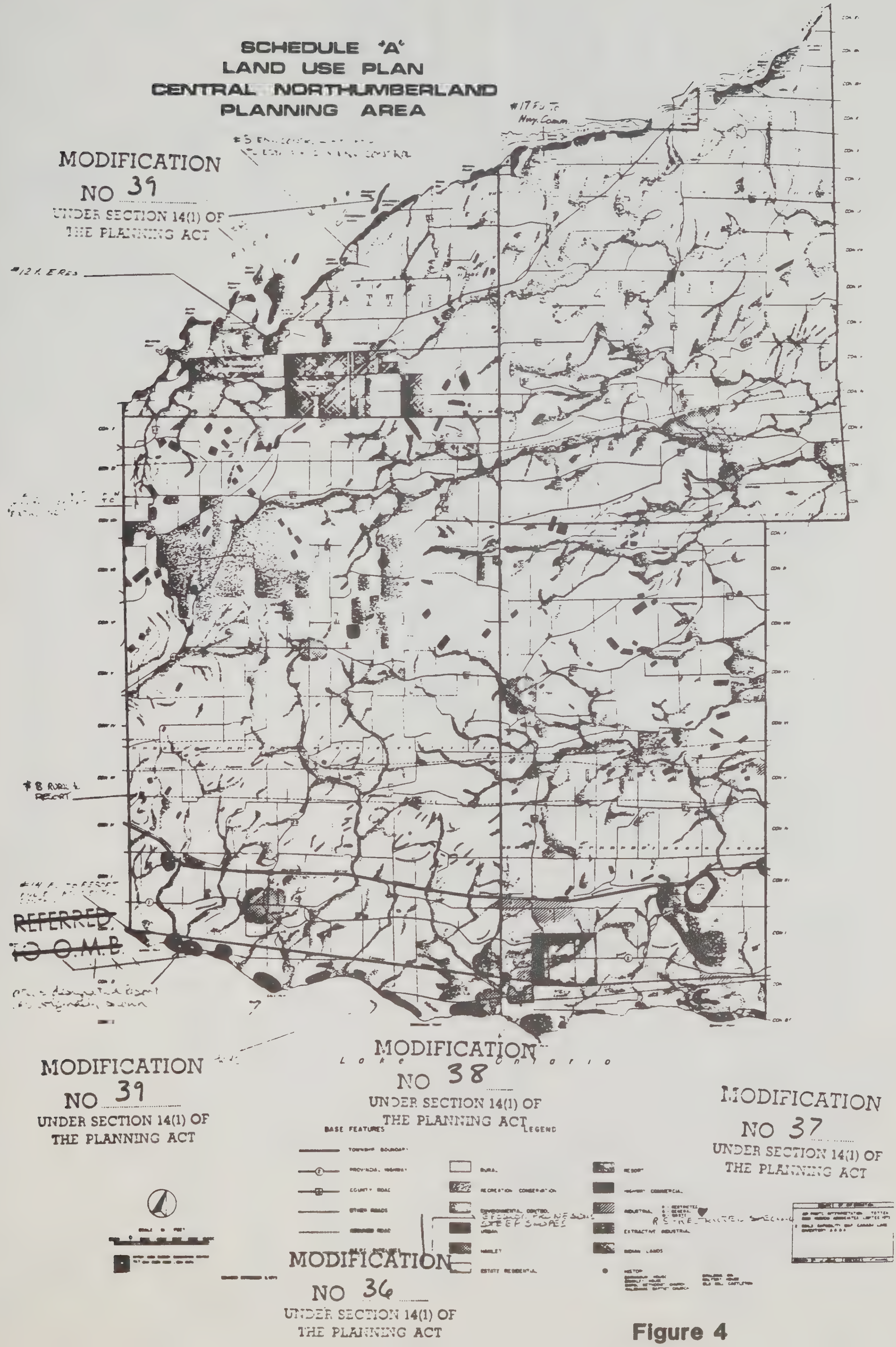

SCHEDULE "A"
LAND USE PLAN
CENTRAL NORTHUMBERLAND
PLANNING AREA
MODIFICATION
NO 39
UNDER SECTION 14(1) OF
THE PLANNING ACT
REFERRED
TO O.M.B.
MODIFICATION
NO 38
UNDER SECTION 14(1) OF
THE PLANNING ACT
Lake Ontario
MODIFICATION
NO 39
UNDER SECTION 14(1) OF
THE PLANNING ACT
MODIFICATION
NO 37
UNDER SECTION 14(1) OF
THE PLANNING ACT
BASE FEATURES
LEGEND
MODIFICATION
NO 36
UNDER SECTION 14(1) OF
THE PLANNING ACT

Figure 4

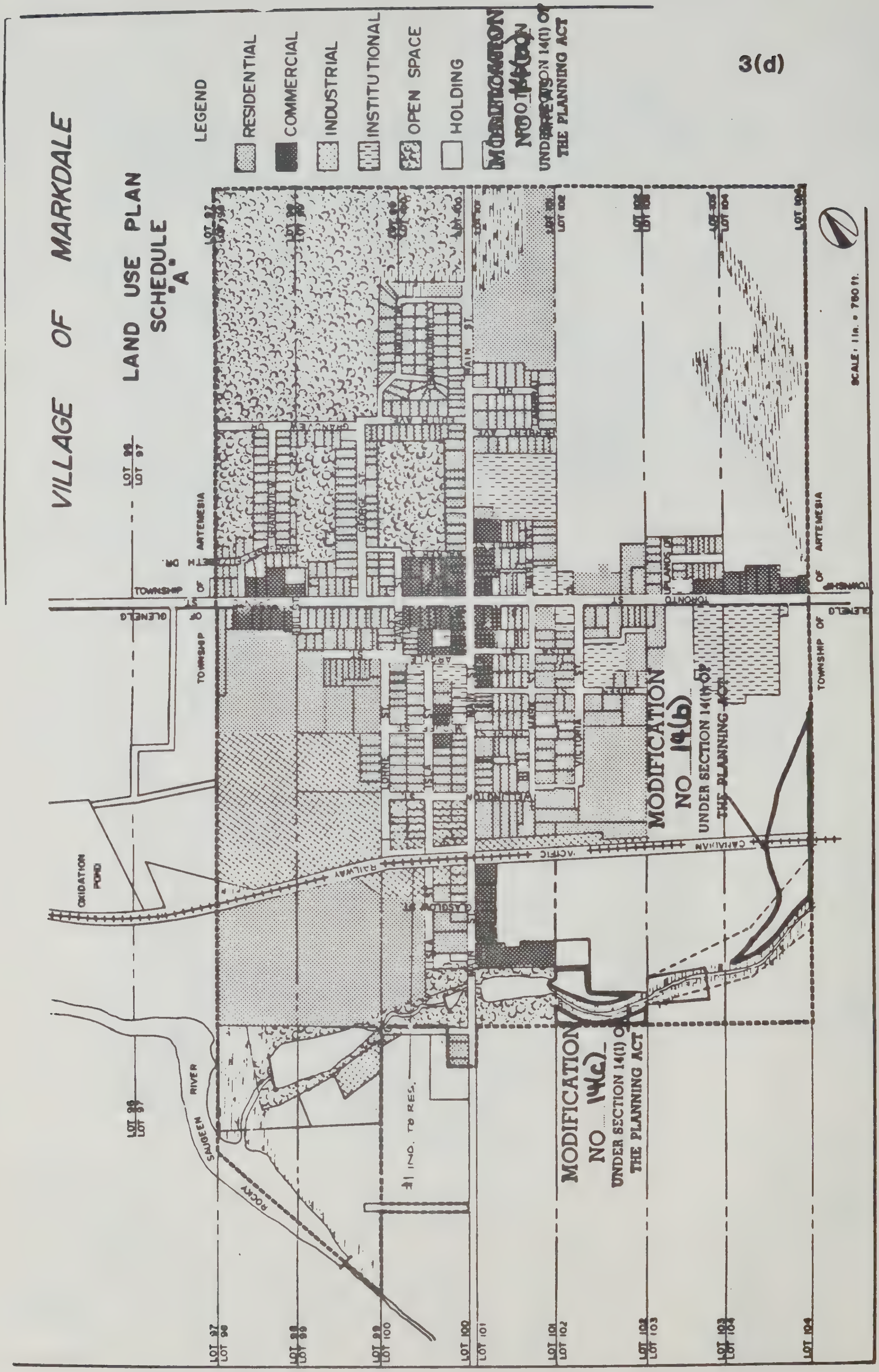
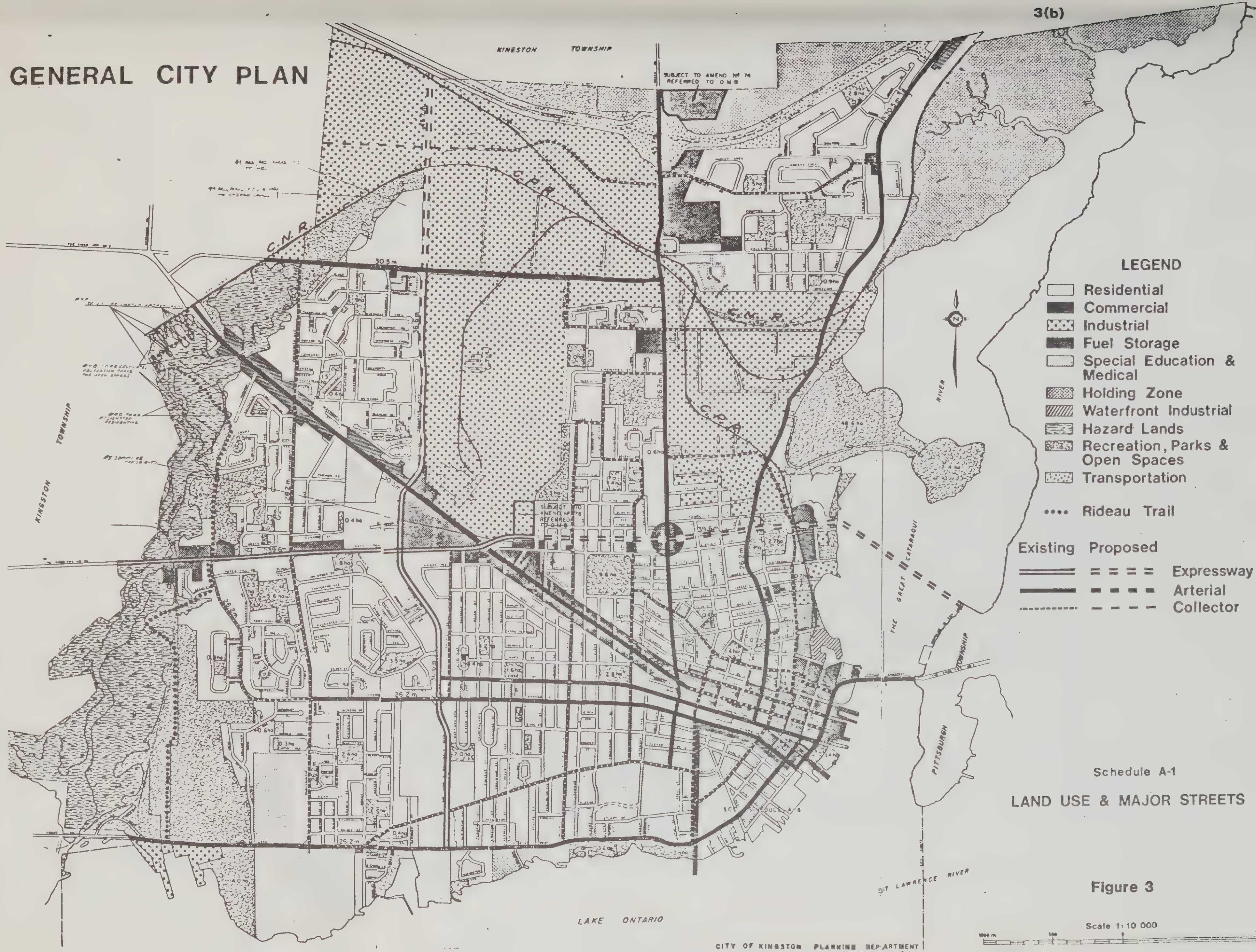

VILLAGE OF MARKDALE
LAND USE PLAN
SCHEDULE "A"
LEGEND
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
INSTITUTIONAL
OPEN SPACE
HOLDING
3(d)
MODIFICATION NO 14(b) UNDER SECTION 14(1) OF THE PLANNING ACT
MODIFICATION NO 14(c) UNDER SECTION 14(1) OF THE PLANNING ACT
OXIDATION POND
ROCKY SAUGEEN RIVER
CANADIAN PACIFIC RAILWAY
TORONTO ST
TOWNSHIP OF ARTEMESIA
TOWNSHIP OF GLENELG
SCALE: 1 in. = 750 ft.

Figure 5

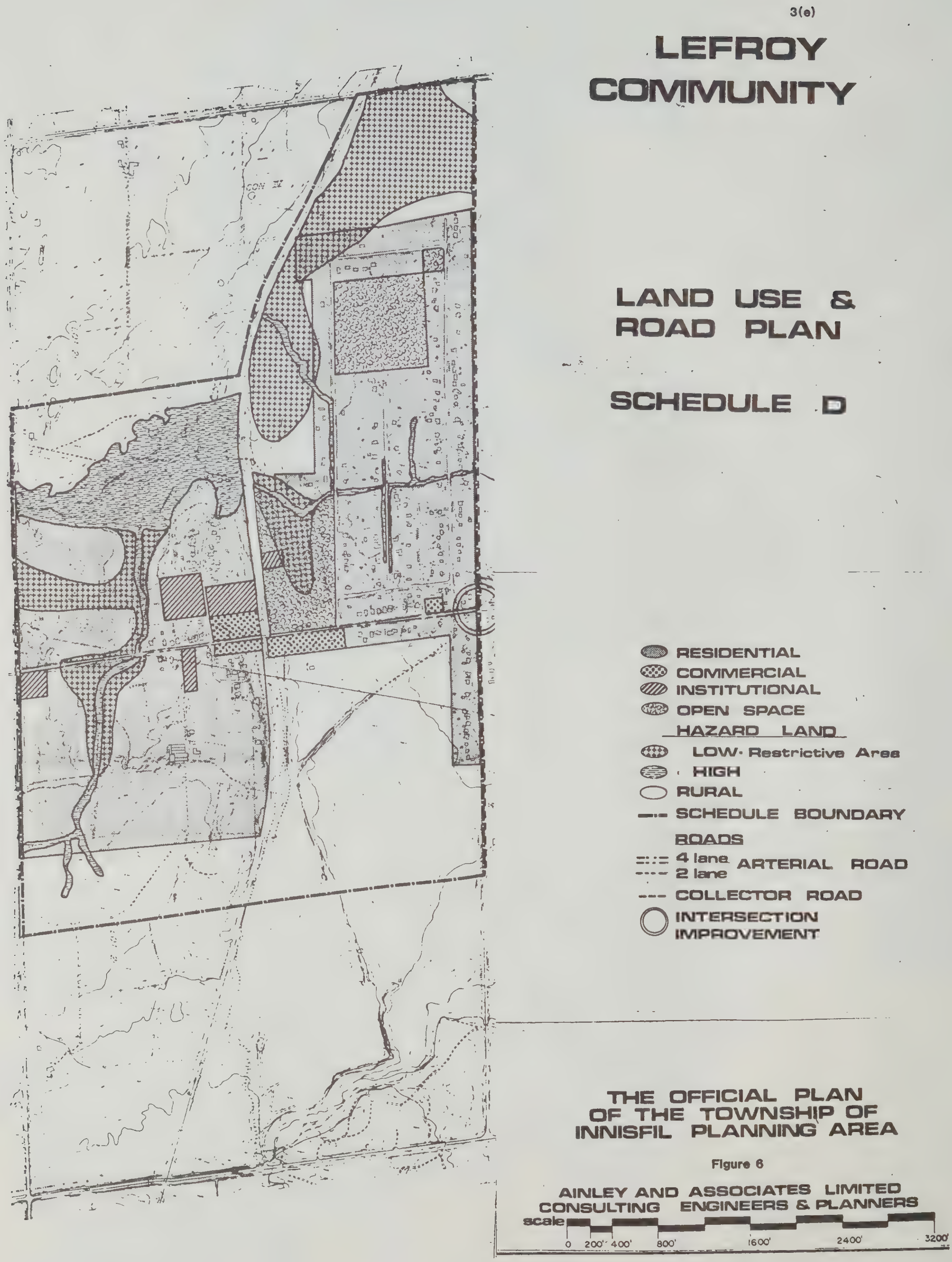
GENERAL CITY PLAN



Schedule A-1

LAND USE & MAJOR STREETS

Figure 3


3(e)
LEFROY COMMUNITY
LAND USE & ROAD PLAN
SCHEDULE D
RESIDENTIAL
COMMERCIAL
INSTITUTIONAL
OPEN SPACE
HAZARD LAND
LOW · Restrictive Area
· HIGH
RURAL
SCHEDULE BOUNDARY
ROADS
4 lane
2 lane
ARTERIAL ROAD
COLLECTOR ROAD
INTERSECTION IMPROVEMENT
THE OFFICIAL PLAN OF THE TOWNSHIP OF INNISFIL PLANNING AREA
Figure 6
AINLEY AND ASSOCIATES LIMITED
CONSULTING ENGINEERS & PLANNERS
scale
0 200' 400' 800' 1600' 2400' 3200'

OFFICIAL PLAN PART I

MAP 1. GENERALIZED CITY PLAN MAP

REVISED JAN. 4, 1977

THIS MAP OF THE OFFICIAL PLAN IS PREPARED FOR PURPOSES OF CONVENIENCE ONLY. FOR ACCURATE REFERENCE RECOURSE SHOULD BE HAD TO THE OFFICIAL PLAN AND ANY AMENDMENTS THERETO LODGED IN THE OFFICE OF THE CITY CLERK.

CITY OF TORONTO PLANNING BOARD

OCTOBER 1, 1969

LOW DENSITY RESIDENCE AREAS
MEDIUM DENSITY RESIDENCE AREAS
HIGH DENSITY RESIDENCE AREAS
RESIDENCE AREAS

CENTRAL COMMERCE AREA
REGIONAL COMMERCE CENTRES
DISTRICT COMMERCE CENTRES
COMMERCE AREAS

AREAS OF INDUSTRY
INSTITUTIONAL AREAS
OPEN SPACE
CENTRAL HARBOUR

TRANSPORTATION
EXPRESSWAYS
ARTERIAL ROAD
RAPID TRANSIT (ALTERNATIVES)
POSSIBLE COMMUTER RAIL
OTHER RAIL
TRANSFER POINTS FROM RAIL OR EXPRESSWAY TO TRANSIT

Figure 2

2.2 - Zoning

As is the case with official plans, very few comprehensive by-laws directly address matters relating to rail lines. In general, railways are included within the transportation provisions.

Adjacent land uses are most often zoned to reflect the official plan designation, i.e. industrial, rural.

Developments that require a rezoning include, in most cases, setback requirements and noise attenuation provisions.

2.3 - Development Proposals

The following table describes those developments that are most frequently located adjacent to rail lines and lists the common controls requested by either the rail companies or the Ministry of the Environment.

TABLE 1

Types of Development and Related Land Use Control

Development	Controls
Residential	- noise study - registered warning on title
low-medium density	- fencing, berms, walls - set back - buffer of parks, open space, parking lot, churches
high density	- similar noise and vibration barriers as above - minimum standards for the construction and orientation of buildings
Commercial	- little concern - fencing - buffer - parking lot - pedestrian bridge
Industrial	- little concern - walls, fencing - use of geopraphic features (i.e., elevation, ravines)

2.6 - Agency Comments

Generally, comments pertaining to railways are received from the Ministry of the Environment and the particular railway company involved. The MOE concerns are primarily oriented to noise problems potentially generated by railway lines.

The railway companies comments are of the same tone, limiting residential development in areas adjacent to rail lines. Clearly the railways' interest lies in limiting the potential liability that residential developments bring.

It is the policy of the Community Planning Review Branches to prepare a brief to the appropriate director on subdivision proposals with five hundred feet (500') of an active rail line (see table 2). This brief summarizes the rail traffic situation as provided by the railway company and usually re-iterates those concerns submitted by the Ministry of the Environment. The comments, where appropriate, are articulated in the conditions of draft approval.

Ministry of the Environment -
The Ministry of the Environment requests that the developer contact their Noise Pollution Control Section to discuss the feasibility of the development. A noise study is usually required.

In order for the development to meet standard noise and vibration requirements, MOE will submit a list of conditions that the developer must meet. Common conditions to be included in the site plan are:

1. that a solid barrier be erected (including the height and location)

TABLE 2

REVIEW OF PROPOSED DEVELOPMENTS NEAR RAILWAYS (WITHIN 150 m)

CRITERIA	COMMENT
STATUS OF PLANNING DOCUMENTS	
1. Type of Application (By-law/consent/ zoning order amendment)	
2. Plan of Subdivision (pending/d.a./ proposed action)	
3. Official Plan or Amendment (pending with minister?/proposed action)	
TYPE OF DEVELOPMENT	
4. Use Proposed	
5. Distance from Track	
6. Existing berms or protective measures	
7. Status of Lot(s) (on which development is proposed)	
RAILWAY INFORMATION	
8. Type of Track (spur, main)	
9. Number of Trains (per day)	
10. Speed of Trains	
11. Elevation of Track (above/at/below grade)	
12. Configuration of Track (curve ...)	
EVALUATION:	

2. that windows of a standard acoustical performance level be installed

3. that a duct heating system be installed for air conditioning

4. that a warning be placed in the Offers to Purchase and/or rental agreements regarding noise levels

If the guidelines for new residential developments cannot be met, even with technical adjustments, MOE will oppose the application. If an amendment to the official plan is required in an area with a serious noise problem, MOE will oppose a residential designation, suggesting a noise insensitive land use. (see Appendix G for further details.)

Railway Companies -
The railway companies provide the ministry with a standard list of conditions which includes the following:

1. installation of a landscaped berm to abate noise and buffer the visual effects of the railway operation
2. dwelling units and lots be situated in areas where the impact of the exposure to the railway operation is least
3. a construction standard which considers acoustical insulation
4. a clause registered on all Offers of Sale and Purchase indicating:

   a) the existence of a rail right-of-way and the possibility of alterations and/or expansion
   b) that despite design measures to alleviate the impact of noise, owners may still be subject to noise and vibration levels which are unacceptable to them

5. the provision of a chain link fence to be erected and maintained by the owner

6. no alterations are to be made to existing drainage patterns or structures of the railway right-of-way unless it is approved by the company

In general, the rail companies will oppose residential development on the heavily travelled mainlines. Canadian Pacific objects in principle to residential development adjacent to their rail lines. (see Appendix G for further details.)

2.5 - Innovative Uses

Introduction -

When planning for land adjacent to rail the planner must consider:

1. the safety level of the area (i.e., the number and type of trains passing through)
2. the health of nearby residents (i.e., living conditions considering the noise and vibration level)
3. the visual impact of the railway on the surrounding area

All three issues must be considered to create an innovative land use that is not only compatible with the adjacent rail lines but with the other (surrounding land uses).

Example -

Talka Village

The Talka Village development is located west of Toronto. The development sites the rear wall of townhouse units adjacent and parallel to the CNR mainline. The solid outer wall facing the track is composed of several layers of concrete blocks to insulate against sound. The wall is protected by an earthen berm which runs adjacent to the track for the length of the development. This type of arrangement appears to further protect the dwelling unit from the excessive noise generated at the site.

Other Innovative Approaches -

Other innovative uses include the provision of recreational playing fields, golf courses, etc. in open space buffers

adjacent to railways. In this way the open space buffer protects and isloates potential noise problem areas from residential uses, in addition to meeting the recreational needs of the community.

Railway Relocation Studies

Several municipalities throughout the province are currently engaged in railway relocation studies. Under the Railway Relocation and Crossing Act municipalities may initiate programmes to reroute railway traffic or relocate rail lines in those areas where the presence of the rail line under-utilizes the site's potential for development.
To date, the Ministry of Housing has received only one formal submission related to lands affected by a railway relocation study. The recently submitted amendment to the North Bay Official Plan outlines the city's intent to redesignate the waterfront area from "Railway Uses" to "Waterfront Redevelopment Uses" in order to encourage the redevelopment of the land for recreation, residential, governmental and commercial uses.
Although this form of development steps beyond the context of the previously mentioned innovative uses it does represent an alternative to railway/land use planning.

12

Ontario/Quebec Border to Frontenac County

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Glengarry County (includes the townships of Lancaster and Charlottenburgh)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Glengarry Planning Area	.see municipalities		.objective of plan to minimize existing or possible conflicts in use of land and to protect...detrimental factors .buffering between land uses .rail passenger service	.predominantly rural	.none recently .common procedures -circulate to MOE and Rail Company
2. Charlottenburgh Township	.no provisions	.predominantly rural			
3. Lancaster Township	.Railway Crossings and Sight Distance .SEE APPENDIX A PAGES 1-5	.rural			

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Dundas - See Prescott and Suburban O.P.

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Stormont - City of Cornwall

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. City of Cornwall	.no provisions	.agricultural .commercial .manufacturing	.Transportation Uses -policy to develop a comprehensive Transportation Plan that will ultimately eliminate the rail system that divides the city .SEE APPENDIX A PAGE 6	.agricultural .commercial .manufacturing .residential	.common controls
2. Township of Cornwall	.no provisions	.agricultural .manufacturing			

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Leeds and Grenville

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Prescott and Suburban	.not applicable	.not applicable	.Public Uses - Section 10 -railways included .Industrial Policies - Town of Prescott -industries requiring direct access to railway lines shall be permitted to build on or over right-of-way subject to approval .SEE APPENDIX A PAGES 7-8	.industrial .residential .rural	.common controls
2. Town of Prescott (Secondary Plan)	.no provisions	.residential	.not applicable		

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Leeds and Grenville (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
3. Township of Augusta	.no provisions	.industrial .rural	.see Prescott and Suburban O.P.	.see Prescott and Suburban O.P.	
4. Township of Edwardsburgh	.no provisions	.rural	.see Prescott and Suburban O.P.	.see Prescott and Suburban O.P.	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Frontenac County

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Kingston Township	.general provisions for Industrial zone -setbacks (Sec. 27)	.predominantly agricultural .also residential zones and environmental protection	.Railway Crossing Improvements .Land use policy "where it is anticipated that the new residential development could be subjected to excessive noise levels, appropriate noise abatement conditions will be assigned. As a guideline, new residential development should not be permitted in any area that transportation noises will exceed a level of 56dBA." .include in industrial -adequate buffer .SEE APPENDIX A PAGES 9-14	.predominantly rural .environmental protection areas .general industrial .pits and quarries	.Subdivision file 10T-78027 -draft approved, for commercial -noise barrier and attenuation in construction MOE condition .Subdivision file 10T-78036 -registered -separation from rail required -for apt. .Subdivision file 10T-76123 TID -railway did request fence and noise attenuation features if approved .Subdivision file 10T-79091 -draft approved -noise attenuation features recommended by MOE

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Frontenac County (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
2. City of Kingston	.general provisions in Industrial Zone .SEE APPENDIX A PAGES 23-29	.predominantly through Industrial .open space .commercial	.Residential -all land uses which are harmful to, incompatible with residential uses are not allowed in any residential zone (section 2.3) .Fuel Storage -residential uses not permitted in area (section 2.8) .Specific Area Policies -CBD and Waterfront -City wishes to remove track and acquire ROW .Design of Apartments, Multiple Housing and Institutional Buildings 15.6 "All forms of multiple housing shall be screened from adjacent rail ROW by planting .SEE APPENDIX A PAGES 15-22	.predominantly abuts Industrial and Hazard Lands .Recreations, parks, open space .holding zone .fuel storage .waterfront Industrial and recreational	.Subdivision file 10T-78047 registered -distance separation and fence required -zoning for parking next to rail line to provide maximum distance

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Frontenac County (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
3. Pittsburgh Township (the planning area is is served by the main east-west CNR line).	.no provisions		.Industrial Development - section 3(b) -objective of plan is to provide potential industrial land where access to rail facilities is maximized. .Restricted Industrial - section 3(10)(6) -railway uses included in this category .SEE APPENDIX A PAGES 30-31		.Subdivision 10T-78099 -draft approved -fence required -no noise concerns

Lennox and Addington County to the Regional Municipality of Durham

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Lennox and Addington - Napanee

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Napanee Planning Area	.railway spur in Industrial zone section 6(22)(f) .Property Abutting Railway "Notwithstanding...no interior side yard or rear yard shall be required along that portion of such lot line which so abuts the railway right of way"	.mainly industrial SEE APPENDIX B PAGE 1	.none .Res-compatibility with surrounding .buffering between incompatible .included in Industrial	.industrial .open space .some residential .SEE APPENDIX B .PAGES 2-3	-rail as passenger route becoming less significant -try to encourage Ind. - for freight .generally applications circulated to MOE and rail company .no recent proposals 1-commercial development bylaw 316-79 R_2 to C_3

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Hastings County (includes Sidney Township and City of Belleville).

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Sidney Township	No provisions		.proposed plan .Rural Industrial - section 2.17.8 -includes transportation terminals -township is served by several rail lines .Amenity and Environment -buffering required between conflicting land uses -special restrictions .SEE APPENDIX B PAGES 7-11	.predominently through priority agricultural .A_2 .urban residential .highway commercial .urban industrial	.subdivision file 12T-77100 - industrial development no concerns
2. City of Belleville	.Restricted Industrial Part V -provisions of zone have regard for setbacks in relation to railway right-of-ways. .General Industrial - Part W -permitted uses include rail uses .SEE APPENDIX B PAGES 4-6	.industrial	.none	.industrial	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Northumberland County (includes Cobourg, Port Hope, Brighton Village, Colborne Village, Central Northumberland Planning Area, the township of Brighton, Cramahe, Haldimand, Hamilton, Hope and Murray

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Northumberland Development Strategy	.no provisions	.not applicable	.no policies	.not applicable	.not applicable
2. Town of Cobourg	.no provisions	.commercial .industrial .open space .residential .rural residential	.Roads Policy - section 5(3)(c) -intent of plan to replace level crossings with grade separations or other protective measures -also development of noise abatement policies for residential development -railways have supported industrial designations along the rail lines .SEE APPENDIX B PAGE 12	.commercial .industrial* .residential *lands abutting rail line have primarily been designated industrial	.not applicable

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Northumberland County (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
3. Town of Port Hope	.no provisions	.reflect O.P. designations	.no policies	.commercial .industrial .open space .residential	.not applicable
4. Brighton Village	.no provisions	.agriculture .environmental protection .industrial .residential	.Brighton and Suburban O.P. .Transportation Policies section 4(5) -now development in vicinity of railway to be designated to reduce conflicts .SEE APPENDIX B PAGES 13-24	.industrial* .rural .open space *lands abutting rail line have primarily been designated industrial	.Subdivision File: 14T-79089 Lots 3 and 4 Concession I (in conjunction with O.P.A. #7) -residential cluster development - 133 units -MOE has identified noise problem .SEE APPENDIX B PAGES 25-31

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Northumberland County (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
5. Village of Colborne	.see Cramahe Township	.environmental control .industrial .residential (existing)	.see Central Northumberland Planning Area	.see Central Northumberland Planning Area	.not applicable
6. Central Northumberland Planning Area (includes twps. of Cramahe, Haldimand and Village of Colborne) - see municipalities	.see municipalities	.see municipalities	.Basis of plan-section 1.4 -recognizes recreational potential of Lake Ontario shoreline-no reference to railway .Residential objectives section 2.5.h -to incorporate buffers to separate residential areas from commercial and industrial sites and railway lines. .Transportation Objectives section 2.13 .Road Policy - section 4.6 -to eliminate level crossings .Urban Industrial Uses section 3.4.g .Industrial Uses section 3.11.b .SEE APPENDIX B PAGES 32-40		.see municipalities

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Northumberland County (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
7. Township of Brighton	.no provisions	.agriculture .highway commercial .residential	.see Village of Brighton remarks	.rural .village (Smithfield)	.not applicable
8. Township of Cramahe	.Provisions for non-residential uses -no interior or rear yard is required for uses abutting railway lands. .Railway Spur - section 9.1.k -railway spur is a permitted use on side or rear yard of an Industrial Zone, but not within any planting strip area. .SEE APENDIX B PAGE 41	.environmental control .industrial .rural .rural residential	.see Central Northumberland Planning Area	.see Central Northumberland Planning Area	.not applicable

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Northumberland County (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
9. Haldimand Township	.no provisions	.environmental control .industrial .recreational commercial .rural .seasonal residential	.see Central Northumberland Planning Area	.see Central Northumberland Planning Area	.Subdivision File-14T-79024 Lots 34 and 35 Concession B (in conjunction with O.P.A. #14) -proposes 36 seasonal units between railway and Lake Ontario -MOE has indicated that adequate noise attenuation features cannot be incorporated in seasonal residential construction -decision pending .SEE APPENDIX B PAGES 42-69 .Subdivision File: 14T-76004 Lots 29 and 30 Concession B -52 lot seasonal development -draft approved 79-09-04 -conditions of draft approval included matters related to

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Northumberland County (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
					noise level from train traffic .SEE APPENDIX
10. Hamilton Township	.General Industrial Zone - section 15 -no side or rear yard requirement where industrial use abuts a rail-road right-of-way .SEE APPENDIX B PAGE 70	.agriculture .deferred develop-ment .highway commercial .industrial .institutional .open space .residential - low density	.no official plan .interim land sever-ance policy (does not address rail)	.not applicable	.not applicable

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Northumberland County (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
11. Hope Township	.Public Uses- section 6(16) -by-law does not apply to uses permitted under Railway Act. .Schedule B(21)- Footnotes -setback provisions .SEE APPENDIX B PAGES 72-73	.Reflect O.P. designations	.Environmental Objectives section 2.3.d -recognizes demand for industrial lands in the area of Wesleyville generating station, due to availability of transportation services, including rail. .SEE APPENDIX B PAGE 71	.deffered residential (adjacent to Port Hope) .industrial .rural .special use (hazard land)	.not applicable
12. Murray Township	.no provisions	.agriculture .commercial .industrial .institutional .residential	.see Brighton and suburban O.P.	.aggregate reserve .environmental protection .future urban development .highway commercial .industrial .rural .special urban (Smithfield)	.not applicable

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Durham Region

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Durham Region	.not provided		.section 1.2.10-1.2.13 require noise analysis for new res. or other noise sensitive development adjacent to rail or road land uses .SEE APPENDIX B PAGE 74	.no pattern to distribution of land use .rail runs parallell and to the south of 401	.subdivision 18t-76019 Township of Brock. -CN comments no real concern
2. Pickering District	."		.pending approval .General Design Policies section 5A3D -res. rail conflict addressed in terms of standard development controls .CN has no objection to the plan .CP requested only industrial uses be located on their line	.all	.subdivision file 18T-80006 -SFD's -OPA needed -requested noise study .SEE APPENDIX B PAGES 80-102 .18T-77080 -43 res. unit -approval recommended by MOH - depressed track and sufficient distance from rail

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Durham Region (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
3. Town of Ajax	"		.section 8.4 identifies conflict between rail other uses .plan does not assign land uses. This is done by Development plans adopted by council .SEE APPENDIX B PAGE 76		
4. Town of Whitby	"		.section 10.3.9 -deals with railway and land use .SEE APPENDIX B PAGE 77	.generally industrial and open space	
5. City of Oshawa	"		.two statements dealing with noise .SEE APPENDIX B PAGE 78-79	.generally industrial	.subdivision 18T- 24366 -study of rail traffic -recommendation - reasonable protection
6. Town of Newcastle	"		.none		

Metropolitan Toronto to Middlesex County

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Metropolitan Toronto
SEE APPENDIX C PAGES 1-45

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Halton, includes Oakville and Burlington

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Oakville	.reflects O.P.	.all zones	.recognizes rail line as ideal for Industrial - permitted use .no residential development near rail if excessive noise unless noise alteration features OPA #30 .indirect - utilizing transportation system -proposed grade separation .SEE APPENDIX C PAGES 46-53 MAP IN ENVELOPE	.all .major is industrial	.dealt with as general for Halton Subdivisions/Condominium - non delegated files -no policies -MOH - more careful review of those within 500' they are circulated to rail company .Delegated files -MOH concern limited to confirming that MOE and railway circulated -CN - encourage industrial 1. fence 2. assurance on changes to drainage pattern 3. res. dev. - warning statement on title MOE 1. noise studies→ reflecting the amount of controls.

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Halton (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
2. Burlington	.reflects O.P.	.all zones	.uses location of rail as criterion for staging of industrial uses .historical rationale used for some residential near rail -section 11.24 .General Policy for existing rail - section 1.2.2.1.6 .future development policies-rail OPA52 .SEE APPENDIX C PAGES 54-58 MAP IN ENVELOPE		

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Hamilton-Wentworth - includes Town of Ancaster, Dundas

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Hamilton-Wentworth SEE APPENDIX C PAGES 59-60	-reflects O.P.		.Proposed O.P. -Rail Policy -Direct lines conflicting with existing land use be removed -unsafe crossings eliminated, and rail companies encouraged to landscape to minimize effect on adjacent land use -policy included to discourage new res. development adjacent to rail -improve access to rail services while minimizing detrimental effects. .SEE APPENDIX	.all	.Town of Dundas - request for dev. not pursued, but when circulated to CNR their request was 90' setback from R.O.W.
2. Town of Ancaster			.Town has direct rail policy	.no urban development existing or proposed near rail	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Counties of Oxford, Brant, and Middlesex
Oxford County (includes Cities of Brantford, Woodstock, Town of Paris, Townships of Brantford, North Dorchester, South Dumfries, Westminster).

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Oxford County (generally very little information)	.no provisions		.Amenity and Design - section 4.5 -buffering where there is a conflict in land use .Noise Protection Measures section 4.5.5 -residential uses close to rail lines permitted only if appropriate noise and vibration abatement measures are provided .Transportation - section 9 -railway crossing improvements .SEE APPENDIX C PAGES 61-65	(in general) .commercial .industrial .open space .residential	.information provided is over-view in nature .policy to prepare a brief for branch director on subdivision proposals within 500' of an active rail line .standard conditions .SEE APPENDIX C PAGES 61-65

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Oxford County (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
2. City of Woodstock Town of Paris Township of Bayham	.indirect provisions for railways .distance requirements .SEE APPENDIX C PAGES 66-67	.most zones	.not applicable	.see above	.see above

Regional Municipality of York to the District
of Nipissing
(including specified northern communities)

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Regional Municipality of York

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Richmond Hill	-not provided -asked to contact municipalities		.Section 6.4 Railways deal with grade-separate road/rail crossings .SEE APPENDIX D PAGE 1	.all	.19T-80011 -deffered until land use designation clarified and *Provincial guidelines prepared
2. Newmarket			.Section 6 -railroad crossing improvements .Section 3.4 -land use conflicts to be aavoided .buffering between conflicting land use .SEE APPENDIX D PAGES 2-4	.all	.19T-8003 - Town of Markham -noise attenuating fence .19T-80015 - Town of Vaughn -comments by CN for chain link fence, no changes to exising drainage -berm -clause (warning) in all offers to purchase
3. Aurora			.Buffering between conflicting land use .SEE APPENDIX D PAGES 5-6	.industrial .major open space .urban residential	.SEE APPENDIX D PAGES 7-15

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Simcoe County

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Orillia Township (C.N.R.) (C.P.R.)	.none	-open space mainly -development, rural agricultural, and also some industrial	-allows railway buildings in rural areas	-rural	.as in Dufferin County
2. City of Orillia	.none	-residential, industrial, open space	-CPR lands presently under study for redevelopment potential	-residential, industrial, open space	
3. Oro Township	."notwithstanding anything in by-law...any transp. utility owned by Government...may use any land or erect or use land building or structure in any zone provided that any use, building, or structure shall be in substantial compliance with the relevant provisions of this by-law and shall not adversely affect the character or amenity of the neighbourhood				

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Simcoe County (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
	in which same is located." .where public street crosses railway at grade, no building or structure shall be erected within 150 feet of the point of intersection of the center line of both the railway and the street	-mainly agriculture -some open space	-when there is substantial development south of CPR tracks Council and Planning Board must be satisfied that adequate signals are provided	-rural, resort, hamlet residential	
4. Township of Innisfil	.in an Industrial zone a railway spur shall be permitted within a required interior side or rear yard	.mainly agriculture -some residential open space and holding zones	.under public utilities provisions plan says "nothing in this plan shall prevent the establishment of any building or structure associated with a public utility in any area." However, the amenities of the adjacent areas shall not be injuriously affected	.agriculture -also some residential, special policy area	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Simcoe County (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
5. Township of Vespra	.in all zones permit transportation utility owned by government provided: i) use substantially complies with zone provisions ii) structure is designed and maintained in harmony with buildings and structures in zone iii) no exterior storage of goods, materials or equipment in any residential zone	.agriculture - fill-line zone -environmental protection	.township shall encourage the retention of all rail lines currently in use, generally on their existing alignments throughout the Township -railway crossings shall be improved where traffic volumes, sight lines or other factors indicate need for improvement -development, particularly residential dev't adjacent to rail lines shall be set back from the rail line and suitable screening shall be provided -no access points will be permitted onto a road in the immediate vicinity of a rail crossing	.mainly agriculture and rural -some open space	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Simcoe County (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
6. Twp. of West Gwillimbury			.none	.rural, hazard land-fill areas	
7. City of Barrie			."Every attempt will be made to reduce the impact of the railway upon the open space areas which are proposed to be developed on filled (and along the waterfront)".	.mainly industrial, some residential	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Muskoka District

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. District			.policy 7.18 states the district is prepared to co-operate with senior levels of government and the agencies responsible for providing public transportation	.none in this plan	
2. Town of Huntsville	.permitted use in industry .rail intersections visability triangle .SEE APPENDIX D PAGES 16-18	.M_2, M_1 .rural	.none	.Industrial .special study area	
3. Gravenhurst	.none	.Al (rural) .RR (rural res.) .Cl (general com.)	.Policy 3.4 -special restrictions are required along important roads and all railways to provide protection for residential areas	.industrial .general commercial .residential (small)	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Muskoka District (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
4. Bracebridge	.general provisions .railway spur in industrial zone .SEE APPENDIX D PAGE 19	.ru (rural) .M_2 (industrial) .RR (rural res.)			

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Parry Sound

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. North Himsworth Planning Area	.set backs adjacent to railway in industrial zone	.industrial .rural .residential - R_1 .C_1 (commercial)	.new draft .Special Commercial uses specific area encourage along CNR right-of-way .SEE APPENDIX D PAGE 20		.Generally consent, subdivision condominium applications are circulated to MOE and Rail Company -common noise barriers, etc. .There is only one Official Plan that affects this area
2. Armour Township	.railway crossings and sight distances .industrial zone .SEE APPENDIX D PAGE 21	.existing zoning .rural .restricted rural			
3. Strong Township	.no provisions .not approved by OMB				

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Parry Sound (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
4. Village of Sundride	.none	.industrial .commercial .residential			

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: District of Nipissing

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
	.District of Nipissing Zoning Order -no provisions				

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: West Nipissing Planning Area

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
			none		

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Sault Ste. Marie

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Sault Ste. Marie	.Railway as zone boundary - section 3.4.4 .Existing Railway Lines -section 4.12.10 .Industrial Park (M2) section 35 -permits a railway siding and spur line .Light Industrial (M3) -permits a railway siding and spur line .Heavy Industrial (M4) -same as above .Industrial Railway .SEE APPENDIX D PAGES 26-33	.all zones	.Basis of Plan -plan will be amended to include new routes and for relocation of existing CPR routes -consideration given to designating industrial lands along routes .Thoroughfare Plan -establishment of new expressway with subsequent relocation of railway -report prepared by M.M. Dillon entitled "Traffic and Transportation Study" .SEE APPENDIX D PAGES 24-25	.abutting lands carry all official plan designations	.general-when appropriate, proposals are circulated to MOE and railways for comment

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Township of Wicksteed (Hornepayne)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Township of Wicksteed	.General Industrial (M) -railway uses permitted -setback provisions .Rural (A) -railway uses permitted -setback provisions .SEE APPENDIX D PAGES 38-40	.all zones	.Basis of Plan - section 3 -Hornepayne identified as a railway centre -major goal-support and improve community's economic base through expansion/upgrading of CNR division centre .General Development Policies -expansion and upgrading is accompanied with need for a major residential subdivision .Industrial Area - General Development Policies -predominant use of land designated industrial shall be for railway related uses .SEE APPENDIX D PAGES 34-37	.abutting lands carry all land use designations	.general - when appropriate, proposals are circulated to MOE and affected railway(s) for comment .MOE - concerns re: emitted noise and its relationship with the surrounding neighborhoods

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Timiskaming District (includes Town of Englehart and Armstrong Township)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Town of Englehart	.no approved zoning	.not applicable	.no approved official plan	.not applicable	.Plans of Subdivision -no active subdivision files -one proposal in Dack Township which abuts the town -residential -375 metres from rail line .Consent Applications -no applications to date .Minister's Zoning Order -town is covered by RRO 671 -prohibits residential development other than those created by sections 29 and 33 of The Planning Act -no amendments within the past year

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Timiskaming District (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
2. Armstrong Township	.not approved zoning	.not applicable	.no approved O.P.	.not applicable	.Plans of Subdivision -none received in past two years .Consent Applications -currently 3 active files abutting Ontario Northland rail lines -two residential/one industrial -awaiting responses

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Sudbury Planning Area

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
	.District of Sudbury Zoning Order -no provisions		.Railroads - section 6.26 -discusses Councils policies		N/A

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: North Bay Planning Area

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
	.City of North Bay By-law #28-80 .Light Industrial (M1, 2, 3) section 7 -setbacks in relation to railways .Heavy Industrial (M4) -same as above .Restricted Industrial -same as above .Railway Zone (MR) .SEE APPENDIX D PAGES 45-50	.all zones	.Railway Uses - section 2.8 -long term intent of city is to relocate rail lines .Amenity and Design - section 8.4 .SEE APPENDIX D PAGES 41-44	.all designations	.see City of Sudbury comments

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Chapleau Township

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Chapleau Township	.Railway Industrial (M2) - section 9 -permitted uses include railway passenger and freight servicing facilities -provisions re: setbacks, buffering, etc. .SEE APPENDIX D PAGES 51-52	.all zones	.Basis of Plan - section C -railway growth patterns identified in relation to Chapleau's future. .Planning Strategy and Development Concept - appendix 8 -identified use of rail for tourism purposes .Transportation, Communications and Utilities section E -objective - to integrate railway land uses with the overall development of the townsite	.all designations	.see City of Sudbury comments

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: City of Sudbury

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. City of Sudbury	.Light Industrial District (M1 & M2) sections 17 and 18 .Industrial Railway (MR) .SEE APPENDIX D PAGES 53-57	.all zones	.Amendment #1 - section 4.4 Industrial Land Use -includes rail freight .Major Thoroughfares Plan - section 5.10 all major thoroughfares should either underpass or overpass railway intersections .Sudbury Planning Area O.P. Transportation section 6 -railroad policies .SEE APPENDIX D PAGE 58	.all designations	.Subdivision/consent applications, condominium -general - if application abutting rail is circulated to MOE and rail company -Rail comp. - comments on ownership, and conflicting uses .MOE - comments on effect of noise on surrounding land use

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Hearst

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Hearst	.no provisions	.zoned to implement the official plan	.no policies	.residential .commercial	.consent applications .CNR comments - no objections .railways provide ministry with information related to type of material carried on line .results in setback requirements

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Cochrane

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Cochrane	.no provisions	.reflects official plan designation	.no policies	.residential .commercial	.see Hearst comments

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Dryden

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Dryden	.Railroad Industrial .SEE APPENDIX D PAGES 59-61	.industrial .open space .rural .some residential .SEE APPENDIX FOR MAP	.policies to improve transportation links .intersection and crossing improvements .compatibility of land use .located in all areas .SEE APPENDIX D PAGES 59-68	.predominantly industrial .environmental protection .some residential	N/A

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Sioux Lookout

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Sioux Lookout	.none		.need for compatible land use .buffering between incompatible land uses .wish to locate Industry close to transportation facilities .SEE MAP IN APPENDIX D PAGE 69	.future industrial .residential .natural	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Fort Frances

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Fort Frances	.obnoxious uses .no setback requirements in Industrial Zone which abuts on railway R.O.W. .railway zone (M_3) -those uses permitted only under the railway Act or any other Act governing railway operations .SEE APPENDIX D PAGES 70-73	.railway zone .Civic Area .residential reserve	.no direct policies .industrial areas are to be located in proximity to major transportation facilities .barrier must be provided between residential land uses if adjacent to major transportation routes, commercial and industrial uses .M of T and C and the Canadian Transportation Commission should iniciate permanent crossing of C.N.R. track at Victoria Ave.	.Protect R.O.W. .residential reserve .residential .Industrial .Industrial Reserve	.See Sudbury City -similar concerns

Regional Municipality of
Niagara to Grey County

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Niagara - See Municipal Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Peel Region

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Mississauga SEE APPENDIX E PAGES 1-4	.lot provided		.rail - building design	.all .try to avoid residential but passes through a number of res.	.21CDM-76152 -condominium project -city requested berm
2. Caledon			.none	.majority rural	
3. Brampton			.section 3.4 -low density buffer zones between residential and railway .SEE APPENDIX E PAGES 5-6		

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Dufferin County

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Melancthon Twp. (CPR)	.rail spur permitted within any required yard or in the area between the street and required set back	.mainly A1 general agriculture -also through open space and development zones	.none	.mainly agriculture -some residential	Generally for County -applications for new development are circulated to MOE and Rail Companies -noise and vibration controls
2. Village of Shelburne (CPR)			.railway crossing signal on schedule indicates that land development creating increased traffic flow over crossing requires a Planning Board study	.mainly residential and industrial	
3. Amaranth Twp. (CPR)	.as in Melancthon Township	.mainly A1 rural -also open space -hamlet resid. in built up areas	.same as Village of Shelburne	.mainly rural areas -some open space and industrial designations -a little hamlet residential	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Dufferin County (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
4. Town of Orangeville (CPR)	.none	-residential, open space -some general commercial and general industrial	.same as Village of Shelburne	.residential, industrial -also some open space and a limited amount of commercial land	

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Grey County Study Area (includes City of Owen Sound, Grey-Owen Sound, Township of Artemesia, Dundalk and Markdale).

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. City of Owen Sound	.no provisions	.same as official plan designation	.no policies	.commercial .deferred dev. .industrial .open space .residential (designations include right-of-way)	.circulation to affected railroad and MOE .commons conditions of draft approval: a) if serious noise problem deletion of lots b) recognition of potential noise problem c) fencing
2. Grey-Owen Sound	.not applicable	.not applicable	.Rail Transportation -recommends maintenance of existing lines to provide passenger/goods service .SEE APPENDIX E PAGES 7-10	.environmental protection .holding .industrial .primary urban .residential .rural .rural community .secondary urban	.see above

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Grey County Study Area (continued)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
3. Mardate Township	.no provisions	.development zone (holding)	.no policies	.environmental protection .holding .industrial .residential	.see City of Owen Sound comments
4. Dundalk Township	.no provisions	.commercial .development .institutional .residential	.proposed secondary plan .no policies	.commercial .holding .industrial .open space .residential	.see above
5. Holland Township	.holding by-law .no provisions	.holding by-law	.no policies	.no policies	.see above
6. Artemesia Township	.no provisions	.agriculture	.no policies	.no policies	.see above

Surveyed Municipalities

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: City of Thunder Bay - From Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. City of Thunder Bay SEE APPENDIX F PAGES 60-61	.not provided		.O.P. is being updated specific policies dealing with rail have not been developed		.Several small plans of subdivisions -larger lots near rail -berming -no detailed building standards

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Windsor City - from Municipal Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Windsor City	Indirect .Bylaw 728 (Core Area) -permit operation of rail -also as accessory to M_1+M_2 .Bylaw 3072 (annexed) -not included as a permiteed use -spur lines permitted as accessory to manufacturing .SEE APPENDIX F PAGES 62-66 .SEE MAP IN ENVELOPE		Indirect .Residential - pollution control section A.1 .Industrial - location availability of transportation including rail section A.3 Direct Railway - section B.5 .SEE APPENDIX F PAGES 62-66 .SEE MAP IN ENVELOPE	-all of five land use categories -try to encourage commercial and industrial that are suitable from O.P. and surrounding land use.	.subdivisions .SEE APPENDIX F PAGE 65 for applicant and location .13 Detached Dwelling -requirements from Noise Study incorporated into Subdivision Agreement .176 Detached Units 36 semi 38 apartments Commercial Block Church Block -commercial and church to be used as visual screen -minimum lot depth -special noise attenuation features .19 Detached Units neighbourhood park -park to act as buffer -condition of approval a noise study and

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Windsor City (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
					noise attenuation features were incorporated .SEE APPENDIX FOR OTHERS WITH SITE PLAN

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: City of St. Thomas - from Municipal Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. City of St. Thomas SEE APPENDIX F PAGES 57-59 .SEE MAP IN ENVELOPE	.no provisions		No direct policies .Buffer zones, increased setbacks, landscaping for industrial adjacent to residential .Conrail Yard-designated as a special study area .New Official Plan awaiting approval -no negative policies -railway sidings an asset in Industrial areas	.major industrial -highway commercial -open space -residential .SEE MAP IN APPENDIX	.12 storey tower -proposed commercial/ apartment development -awaiting zoning amendment .144 unit apartment -objections raised by MOE concerning OP and zoning amendment .Wendy's Restaurant -approved-existing now .Colour Your World -approved existing now

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: City of Niagara Falls - From Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Niagara Falls SEE APPENDIX F PAGES 56-57	.no provisions		.site specific policy "amelioration of continued problems of traffic circulation and blighting effects of the present Penn Central rail line"	.all	.none .general -most land adjacent to rail has already been developed -if redevelopment, comments from pertinent agencies and government regulation (i.e. noise abutements) as conditions of development

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: City of Brantford - From Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. City of Brantford	.no provisions	.existing land use no attention paid to existence of railway	.no direct reference to railways	.SEE APPENDIX F FOR MAP .appears all types	.Scarfe Heights Subdivision -27 SFD -noise impact -elevation and distance from rail required no provisions .Sipocz Subdivision -semis SFD's -amend zoning bylaw ensure 70' rear yard .Dorbert Holdings Subdivision -48 SFD's abut rail -min setback -condition of draft approval that MOE be consulted .SEE APPENDIX F PAGES 4-9 FOR MAP INDICATING 3 OTHER SUBDIVISIONS AND LOCATION SEE ENVELOPE FOR MAP

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: City of Brantford (con't)

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
					.1971 Transportation Planning Study -desirability of relocating rail to provide environmental improvement .SEE APPENDIX FOR FURTHER DETAILS

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Mississauga - From Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Mississauga	.amendments for recent developments	.for development proposals - see final section	Indirect .Section 3.11 of Goals and Objectives -avoid locating res. dev. in areas where obnoxious atmosphere and noise pollution Direct .Rail Strategic Policy -co-operation with other government levels on policies - see section 4.5.3.7 .Highway and Rail Noise 5.14.2 .SEE APPENDIX F PAGES 44-45 SEE ENVELOPE FOR MAP	.all	.subdivision file T25 227 -SFD's, semis, and row -3m high noise berm -acoustic treatment of building -warning registered on title .subdivision file T-78076 -SFD -fencing -noise study .T79029 -semis - warning on title and fencing .OZ/63/77 -rezoning from Industrial to residential -orientation of buildings -noise on title .OZ 31/75 -portion of property to GO Transit -rezoned from Ag. to Industrial .SEE APPENDIX F PAGES 44-45 FOR MAP AND FURTHER REZONING

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Borough of Etobicoke - From Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. Borough of Etobicoke	.1979-41 -amendment for specific site .SEE APPENDIX F PAGES 14-30	.reflects OP	.Special Site Policy -OP amendment No. D7.14.79 .SEE APPENDIX F PAGES 14-30 .requires suitable land-scaping and sound proofing.	.residential -others not provided	.subdivision .SEE APPENDIX F PAGES 14-30 .residential develop-ment in agreement requires 1. sound barriers 2. minimum setback

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: Brockville - From Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. City of Brockville SEE APPENDIX F PAGES 10-11			.O.P. enables Council to request Noise Impact Study for residential development near railway	.vacant land adjacent to railways on the whole designated for Industrial, Commercial or Open Space .Residential development subject to noise	.none

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: City of Belleville - From Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. City of Belleville SEE APPENDIX F PAGES 1-3	Indirect .only one reference -side and rear yard requirements for industrial abutting rail R.O.W.		.Objectives of Plan Adresses railway in the following: a) buffer to separate res. from com. and ind. and railway lines b) to build grade separations where arterial streets and rail R.O.W. intersect c) to eliminate level or grade crossings or provide protective gates and signals	.trying for mostly non residential .but land use pattern all uses fall within rail	.Res. dev. 22 Apt. 1. landscaped buffer strip 2. thicker walls and insulation for facing 3. inform tennants of rail traffic frequency not applied, application withdrawn .under MOH re MOE - Feasability Study re noise and vibration Applicant withdrew application, therefore closed

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: City of Kingston - From Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. City of Kingston	.reflects O.P.		.Specific Area Policies -removal of tracks and acquisition of some ROW - CBD (were actually removed) .SEE APPENDIX F PAGE 31-43	.various land uses trying to minimize the adverse impact with any land use	.MOBILE Home Park expansion 1. required removal of CPR spur line MOE comments re 1. buffer zone-land-scaping berms .SEE APPENDIX F PAGES 31-43 FOR AGREEMENT AND AIR PHOTOS

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

SUMMARY SHEET

AREA AFFECTED: City of Cornwall - from Municipal Survey

AREA	ZONING		OFFICIAL PLANS		DEVELOPMENT PROPOSALS/ CONTROLS
	By-Law Provisions	Adjacent Zoning	Policies	Adjacent Designations	
1. City of Cornwall SEE APPENDIX F PAGES 12-13	.information not provided	.not provided	.Yes Policies re: Transportation uses -eliminates existing rail system that divides city	.not provided	.None Wish to: 1. increased setbacks 2. provide accoustical barriers 3. make use of existing topography 4. provide barrier walls 5. provide maximum co-ordination between rail and landuse

Ontario Ministry of Housing

"ASSESSMENT OF RAILWAY IMPACTS ON ADJACENT LAND USES"
FOR THE ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

JULY 3, 1980.

Local Planning Policy Branch
3rd. Floor, 56 Wellesley St. W.
Toronto, Ont. M7A 2K4

TABLE OF CONTENTS

ASSESSMENT OF RAILWAY IMPACTS ON ADJACENT LAND USES

INTRODUCTION

The Ontario Task Force on Provincial Rail Policy has been established with a goal to provide a provincial perspective on rail transportation in the Province, and to examine the existing system, identifying changes required for the effective movement of people and goods as a means of enhancing the social and economic development of Ontario.

Many rail issues have been identified for study i.e. the railway's role, the existing railway inventory, railway technology, energy issues, financial issues, environmental issues and jurisdictional issues. The Local Planning Policy Branch was assigned the task of providing a very brief general "assessment of railway impacts on adjacent land uses". The task had two purposes:

1. to determine which uses should be encouraged or discouraged adjacent to rail operations, and

2. to establish development criteria for land uses adjacent to railway operations.

The specific output required by the Task Force, and the basis for the organization of this report, is set out in Appendix I.

I IMPACTS ON ADJACENT LAND USES

(i) Noise - Noise is probably the prime adverse effect of railway operations. Noise can produce a range of physiological and psychological effects which in turn have individual, social and economic consequences.

Hearing loss begins to occur with prolonged exposure (8 hours or more) to sound levels ranging from 80 to 90 dBA. Disturbance to sleep can occur at sound levels between 35 and 90 dBA. At a 40-45 dBA level there is a 10-20% probability of a shift to a lighter stage of sleep. Generally, excessive noise contributes to irritability and loss of concentration.

Sudden noise can be particularly annoying and has been found to increase blood pressure and affect the digestive system. Speech interference between two people standing 3m (10 feet) apart will occur at the 55 dBA level.[1]

The A-weighted sound level, Leq, Ldn and Single Event Noise Equivalent Scale (SENEL), are the noise exposure scales commonly used to measure railway noise. It is now believed that these scales in themselves may not accurately reflect the effect of noise annoyance on humans. The Local Planning Policy Branch of the Ministry of Housing is currently undertaking a study of railway noise and vibration which will be re-examining the existing descriptors to determine if some adjustment to them is needed.

Key factors in the annoyance disturbance effect of intruding noise are its amount and nature, particularly its intensity, frequency and duration. Railway noise has a number of sources, each differing in terms of these characteristics. Railway noise falls into two categories - rail line noise and rail yard noise.

Rail line noise includes noise from locomotives, wheel-rail interaction and warning systems. Of these, locomotive noise is the most obtrusive. The main components of locomotive noise, in order of significance, are engine exhaust noise, casing radiated noise,

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1. A. Armour and R. Lang, Impacts of Urban Railways, University of Toronto/York University Joint Program in Transportation, Toronto, April, 1979. pp 57-59.

- 3 -

cooling fan noise and wheel rail interaction. As an example, locomotive pass-by noise has been measured at 100 dBA at 7.6m (25 feet). No definite relationship appears to exist between speed, or number of coupled locomotives and maximum locomotive speed.[2]

Wheel-rail interaction and warning systems, although less obtrusive, are also serious noise sources.

Noise from rail yards emanates from a number of points including the receiving yard, classification yard, departure yard, engine service areas and repair shops.

The classification yard is the main noise source. The shunting and coupling of cars causes a near continuous engine roar and banging along with retarder squeal. Retarders which are used to slow down moving cars before coupling often generate a high pitched squeal which is very penetrating and probably the most annoying of rail yard noises. Both retarder and car impact noise are unexpected and therefore more alarming to the receiver.

Locomotives which are often allowed to idle continuously, even overnight, are also a major source of resident complaints.

To assess the impact of existing railway operations on a proposed development or to assess the impact of a proposed railway facility on an existing community, it is necessary to predict wayside noise levels and to establish criteria for noise acceptability. The current state of the art presents some problems for noise impact assessment: information on railway noise, especially in the Canadian urban context, is scarce; reliable data for some sources of railway

2. Armour and Lang p. 65.

noise is not available; railway noise prediction models are not well advanced; and measures of public acceptability are only just beginning to be developed.

Railway noise is not generally a serious problem with respect to most industrial and commercial operations which usually generate high noise levels themselves. Because of this, they can often be used as a noise buffer for more sensitive land uses.

Open space and parkland uses can be used as a distance buffer between railway operations and more sensitive land uses depending on the type of activity. Certain passive outdoor activities such as picnicing, reading, etc. could be adversely affected. More intensive active sports such as baseball or soccer would likely not be affected.

Agricultural uses would generally not be affected by railway noise.

By far the most serious problem with respect to railway noise is its impact on residential areas. Interferences with sleep and enjoyment of outdoor privacy spaces is the most common complaint. Medium and higher density developments can be less susceptible to railway noise than low density developments as they can be designed to shield sensitive areas from the source.

Lighter train operations obviously would generate less noise. Commuter rail, Light Rapid Transit (LRT) and subway operations use lighter cars, shorter trains and are often electrified. Also, they usually do not run at night when residential areas are most sensitive to noise. Generally, people have a more favourable image of these types of train operations than they do of heavy freight operations and thus are more willing to accept the noise associated with them.

- 5 -

(ii) Vibration - The effect of vibration from railway operations has not been well researched. What information there is has been done for the most part on rapid transit systems such as subways and LRT's.

Vibration intensity is measured in terms of frequency (in cycles per second or Hertz (Hz) and maximum velocity (in inches or millimetres per second). High intensity vibration such as that generated by earthquakes can make buildings collapse. Lower intensity levels such as those from blasting can cause structural damage to buildings.

Humans are sensitive to vibration at much lower levels than that required to produce structural damage. Human response to vibration from railway systems is complex. It is influenced by both physiological and psychological factors as well as by the type of structure affected and the nature of occupancy. At low frequencies (around 10 Hz) vibration is only felt; at higher frequencies (above 30 Hz), it is both felt and heard. Vibrations from railways, resulting primarily from wheel-rail interaction, are transmitted into the roadbed and adjacent structures.[3]

Presently, it does not appear possible to predict accurately the vibration and noise generation levels that will be experienced by an adjoining community following the installation of a new rail system. The current railway noise and vibration study being undertaken by the Local Planning Policy Branch of the Ministry of Housing and vibration studies being undertaken by the Ministry of Environment should provide some guidance in this area.

The adverse affect of railway vibration on humans in residential areas is essentially one of annoyance.

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3. Armour and Lang, pp 103, 104.

Again, there is little concrete information available on this until studies currently underway are concluded.

Most commercial and industrial uses are not sensitive to vibration unless it is in the ranges which could cause structural damage. This is not likely to happen with railway induced vibration. However, certain types of commercial uses such as movie theatres or auditoriums are very sensitive to vibration. Some types of industrial uses where fine instruments are used would also be adversely affected by railway vibration.

Institutional uses such as hospitals, museums and schools would likely be adversely affected by railway induced vibration. Others of a more general office type would not.

Agricultural, open space and parkland uses would not be sensitive to railway vibration.

Generally, vibration produced by commuter rail, rapid transit systems and LRT's would be less than that for heavy rail operations. However, vibration studies done for these systems, including the Scarborough LRT, have show that vibration levels can be significant and must be taken into account with respect to adjacent land uses.

(iii) Air Pollution - The main air pollution characteristics of railway operations can be described in three categories: magnitude of emissions, pollutant emission relative to other modes of transportation, and the pollution factor or degree of harmful effects associated with each pollutant emitted. There has been no comprehensive study of the nature and effect of railway air pollution in Canada. Most of the data available is from U.S. publications.

In both rail line and rail terminal operations the largest proportion of air pollution is produced by diesel locomotives. Loss of material such as coal dust from open top cars and dust at terminals and yards is also a possible source. In some studies of electrified rail systems, electric power generating stations are also included among the sources of rail related air pollution emissions. The principle pollutants emitted by a diesel locomotive are nitrogen oxides, carbon monoxide, hydrocarbons, oxides of sulphur and odourous compounds.[4]

Overall, railways are a relatively small contributor to air pollution compared to other modes of transportation, especially the car. Studies done in laboratories and of Chicago's two largest diesel commuter railways comparing diesel commuter railways with passanger cars and diesel buses showed they were definitely less polluting.

Existing data does not make it possible to determine what effect railway air pollution has on any specific type of land use. However, as the overall emissions are low compared to other pollution sources, it is likely that their effect is not great.

(iv) Safety - Railway safety concerns can generally be grouped into two areas: accidents involving pedestrians and motorists who are in conflict with rail operations i.e. at level crossings and on railway structures and property; and train collisions and derailments.

Although collisions and derailments receive much more public attention, grade crossing accidents are far more numerous. Between 1971 and 1976 in Canada, there were 1,914 derailments and 272 collisions but 6,222 crossing accidents. In urban areas, 54% of the level

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4. Armour and Lang, p 131.

crossings are unprotected and only 16% are grade separated. In rural areas, 80% of grade crossings are unprotected. (For Ontario, these figures are 46% in urban areas and 62% in rural areas.) Overall, the trend over the past few years has shown an increase in railway related accidents.[5]

Five prevalent rail related situations dangerous to pedestrians have been recently identified for southern Ontario:

Busy grade-level crossings not adequately protected by pedestrian facilities.

Double track areas where trains may be approaching from opposite directions.

Traditional or "natural" neighbourhood routes where there are large volumes of pedestrian traffic due to adjacent land uses but no pedestrian crossing facilities.

Limited access rights-of-way (trestle, ravines, etc.) that are inviting to children and others where there are insufficient barriers and/or escape routes.

Areas where lack of appropriate crossing facilities and/or barriers in convenient locations (relative to land use) fosters trespassing onto railway rights-of-way.[6]

Pedestrian and motor vehicle accidents on railway rights-of-way is such a serious problem in Ontario that a tri-level task force was established in 1976

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5. Armour and Lang, pp 151, 152
6. Armour and Lang, p 154

composed of representatives of the federal government, the provincial government and the Association of Municipalities of Ontario. Its purpose was to examine the whole issue of level crossing accidents in the province. This task force has not yet produced a report.

Collisions and derailments, although fewer in number create hazardous conditions for people living and working near rail activities. Rail operations can create such risks in two ways: (1) as a result of accidents during the transport of dangerous commodities such as flammables, corrosives, toxic substances, explosives and radio active materials; and (2) as a result of spills during the loading and unloading of dangerous commodities refuelling and othe day-to-day operations at railway yards.

Accurate statistics are not available regarding the number of accidents involving dangerous commodities. However, it is estimated that there are between 60 - 80 such accidents each year in Canada. This number is small in comparison to other such accidents from other sources such as road, pipeline or marine activities. However, rail accidents and spills are usually much larger than the more common spills from trucks. Most derailments involving dangerous flammable commodities result in fire and/or explosion.[7]

The recent event in Mississauga clearly indicates the potential danger to residential areas of derailments and accidents. Hundreds of thousands of Canadians live in areas adjacent to railway lines and yards and thus in danger of injury or death from railway accidents. Of particular concern are residential buildings which are built close to railway tracks to act as noise barriers to the rest of a residential development.

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7. Armour and Lang, p. 163

Industrial and commercial areas are also frequently located in close proximity to railway operations. Derailments and accidents during working hours could also have a severe effect on these types of land uses.

Rail yard operations, because of their location in or near populated areas, may represent more of a hazard than rail line activities. Loading and unloading of dangerous materials and the sorting and assembling of trains at classification yards comprise a potential safety hazard.

(v) Community Impact - The major community impact of railway operations is the "barrier" effect. The magnitude or intensity of the perceived barrier effect depends on the number, location and structural configuration of the rail facility as well as the number of through trains, switching operations and the kinds of adjacent land uses. Conflict with city traffic is the most prevalent of these conflicts. Negative impacts include loss of time, increased vehicle operating costs due to unnecessary fuel consumption, mechanical damage due to rough level crossings and more air pollution. In some locations, the reliability of emergency services is seriously jeopardized by the potential for delay at level crossings. In some cases duplication of equipment is necessary on both sides of the track.

Another major community impact of the barrier effect is neighbourhood division or isolation. A railway right-of-way can impose a physical boundary that splits or isolates a neighbourhood. This can cause problems with neighbourhood identity. Exactly what this effect is, however, is not well understood.

Blighting of residential areas is another potential negative impact of a railway on the community. In many cities the railway is located in the older parts

of the community. The aged and often substandard condition of the buildings combined with the unattractive features of railway facilities (particularly railway yards and maintenance shops) creates an overall blighted impression.

The exact nature of the relationship between railways and neighbourhood degradation is not known. Generally it is believed that housing next to railways is of lower quality and the perceived negative impact of the railway discourages investment in property maintenance. While there are many examples of this, it is also true that railways run through many high quality, well maintained neighbourhoods as well.[8]

Property loss due to railway locations is better documented. In a recent study done in London, Ontario it was estimated[9] that for two similar properties, one within 100 feet of the tracks and the other over 800 feet away from the tracks, the latter sold for $2,161 more than the former. The example consisted mainly of low and medium density housing types so that the effect on high density housing is not known.

Railways occupy large tracts of land in the core of many Canadian cities. In most cases this is underutilized land and often stands in the way of core expansion. This can hurt core area businesses which may need to expand to compete with suburban shopping centres.

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8. Armour and Lang, pp 174-182

9. Larry C.L. Poon, The Effect of Railway Externalities on Residential Property Values (London, Ontario: University of Western Ontario, Department of Economics, February, 1977).

(vi) Visual Impact - Generally railway lands will be perceived as having a negative visual impact. This would be particularly true of old rail yards where many of the buildings will be dilapidated. This negative appearance can give a poor image to a downtown area further inhibiting revitalization.

II IMPACT ABATEMENT MEASURES

(i) Noise[10] - Noise from railway operations can be controlled by three methods: source control, physical separation of sensitive uses, and use of physical noise barriers.

Controlling the source of the noise i.e. the actual rail operation, requires the co-operation of the federal government and the railways who have jurisdiction in this area. Some of the areas where source control can reduce noise are: use of silencers on diesel engines, use of welded rail to reduce wheel-rail noise, and the development of quieter retarders in classification yards.

The separation of sensitive land uses, particularly residential uses, from potential railway noise problems can be controlled through the municipal planning process which is under the jurisdiction of the provincial government. This requires the consideration of potential noise problems at the very earliest stages of planning. Wherever possible, insensitive land uses such as industrial uses, commercial uses and non-sensitive open space use should be designated along railway corridors and around rail yards. Examples of this type of planning can be seen in the original plan for the community of Don Mills.

It is often not possible to separate all new

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10. Ministry of Housing, Land Use Planning for Noise Control in Residential Communities. 1980. This soon to be published document goes into further details on noise abatement measures.

residential development from railway operations and thus much new development inevitably is located in close proximity to railways. In these cases the solution requires some form of physical noise barrier. Intervening structures can be used as noise barriers but to be effective they must be built fairly close to the noise source. There could be potential safety hazards in this solution. The building must be designed so that noise sensitive parts of the building are located away from the noise source. An example of a building being used as a noise barrier is the Talka Village development in Mississauga where a long uninterupted row of townhouses is used as a noise barrier against the track to shield the remaining houses in the development.

Earth berms and walls can also be used as noise barriers. To be effective, the barriers must be solid, continuous, without holes or gaps and be reasonably dense. No line of sight should exist between the noise source and the area being shielded. Maintenance costs are an important consideration in these types of barriers as grass has to be cut on earth berms, and barrier walls often require painting or other regular care. In order to be stable, earth berms need wide bases and thus can use up a considerable amount of land. If properly designed, these barriers can be very effective.

Earth berms and barrier walls have been used extensively along railway tracks in the Vaughan - Thornhill development area north of Metropolitan Toronto.

(ii) Vibration - As stated earlier, there is not a great deal of information available regarding the effects of railway induced vibration on adjacent land uses. Likewise, mitigation measures are not well understood.

Generally, factors relevant to attentuation are

distance from source and building structure. The conventional approach to minimizing excessive vibration is to consider separately the source, the transmission path and the receiver. Some techniques which have been used to mitigate vibration are: use of all-welded rail, floating track-bed slabs, use of pads under foundations of buildings and between ground and building walls, use of a trench between source of vibration and reception, and floating upper portion of building on pads. Distance can also effectively reduce vibration impact but can be an expensive solution unless a non-sensitive use can be found for the setback space.[11]

(iii) Air Pollution - Overall, air pollution is not regarded as a serious problem from rail operations; however, some improvement is possible. For example, fewer grade crossings would reduce secondary pollution from cars waiting for the train to pass. Also, less long term idling of locomotives, particularly in rail yards, would help reduce pollution. More careful loading and unloading of open-type cars would eliminate some of the dust problem.

(iv) Safety - Three factors contribute most to rail safety problems: poor maintenance, unsatisfactory safety precautions in rail operations and deteriorating roadbed conditions. A recent decision to allow longer and heavier trains has added to these problems. Improving these conditions is a federal responsibility.[12]

From a provincial point of view, the types of land uses permitted adjacent to railway operations should be re-examined with the safety factor in mind.

(v) Community Impact - Reducing the negative barrier effects of railways on the community essentially involves good planning. Neighbourhoods should be planned so that rail operations do not become barriers

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11. Armour and Lang, P. 115.

12. Armour and Lang, p. 153.

to the proper functioning of the neighbourhood. Grade separations should be provided wherever potential traffic and pedestrian flows are high enough to warrant. Neighbourhood facilities should be planned so that they are accessible as much as possible without the need to cross rail facilities.

Under the Railway Relocation and Crossing Act of 1974, the federal government provides financial assistance to municipalities and provinces for planning and relocation of railway facilities which no longer suit their location.

(vi) Visual Impact - The physical state of railway property is a railway concern. It may be possible under the Railway Relocation and Crossing Act to have undesirable railway facilities removed.

III POSITIVE IMPACTS

Railways are an integral part of Canada's transportation system and thus vital to the economic life of the country. This fact is often not apparent to the general public and thus the overall benefits of railways are not considered along with the negative impacts. Railways are very fuel efficient and this fact will become increasingly important in future years as fuel prices rise. This may be particularly true with respect to freight now carried by trucks and for commuter systems.

In some municipalities, railways are major employers, particularly where large terminals or maintenance yards are located.

Of more directly perceptible benefit are commuter rail facilities and rapid transit systems. These types of facilities are gaining more support as fuel prices rise and the public becomes more concerned with environmental

quality. Recently, the use of LRT's on their own rights-of-way has gained considerable support. In Canada, 10 cities are known to be developing or considering light rail transit facilities. The Scarborough LRT currently under construction will link the Scarborough Town Centre with the eastern terminus of the Bloor-Danforth subway.

The economic viability of LRT's is not well known as it is a fairly new technology. However, other factors such as environmental and energy concerns make LRT's an attractive transportation alternative.

IV APPROPRIATE USES

(i) Rail Corridors - Wherever possible, low density residential development should not be placed adjacent to rail corridors. If this is unavoidable, proper noise mitigation procedures as described in Section II should be carried out. Medium and high density development can be permitted adjacent to rail corridors provided appropriate noise mitigation techniques as described in Section II are followed. In all cases, safety with respect to derailments should be kept in mind. Until more satisfactory noise and vibration standards are established for railway operations, noise standards as outlined in Section V should be followed.

Industrial uses and most commercial uses can be permitted adjacent to rail corridors with the exception of those industrial and commercial uses which are very sensitive to noise or vibration.

Many instituional uses such as hospitals, schools, libraries, museums are sensitive to noise and vibration and should not be permitted adjacent to rail corridors unless noise and vibration abatement measures are carried out.

Open space uses are permissible adjacent to rail corridors unless they are noise sensitive. Such activities as picnicing and reading could be adversely affected by noise.

All forms of agricultural uses can be permitted adjacent to rail corridors.

(ii) Commuter Stations and Public Transit Stations and Lines
High density commercial and residential uses are most suitable with respect to commuter and public transit facilities. High densities are required in order to make these facilities function efficiently and economically. Although the operation of these types of facilities does not produce the same amount of environmental disruption as heavy rail activities, proper precautions for such problems as noise, vibration and community impact should still be considered with respect to the planning and design of adjacent buildings.

(iii) Railway Terminals and Marshalling Yards - These are likely the most disruptive of all railway uses and residential uses in general should not be placed adjacent to these facilities. It is very difficult to shield against the types of noise generated by these facilities and only uses such as industry and warehousing operations which are not noise sensitive should be permitted in these areas. If the placement of residential development adjacent to these facilities is unavoidable, the most careful noise and vibration studies should be carried out to ensure minimum residence annoyance.

V LEGISLATIVE FRAMEWORK[13]

The major pieces of legislation affecting railway operations and procedures such as the Railway Act and

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13. Ministry of Housing, Land Use Planning for Noise Control In Residential Communities. 1980. This soon to be published document gives further details on the various types of legislation dealing with noise.

the Railway Relocation and Crossing Act are under the jurisdiction of the federal government.

The Canada Mortgage and Housing Corporation (C.M.H.C.) has developed noise standards for road and rail traffic noise which must be met for a project to receive financing under the National Housing Act. These standards are summarized below:

	Noise Level
Bedrooms	35 dB
Living, dining, recreation rooms	40 dB
Kitchens, bathrooms, hallways, utility rooms	45 dB
Outdoor recreation areas	55 dB

In an ordinary dwelling complying with residential standards, the indoor noise level should be at least 20 dB below the outdoor noise level with the windows closed.

These standards are based on a 24 hour Leq descriptor. As stated earlier, it is felt by some authorities that these standards are not adequate for railway noise and the current railway noise and vibration study being carried out by the Local Planning Policy Branch of the Ministry of Housing should further refine them.

The Ontario Ministry of the Environment has produced guidelines for noise control in land use planning. (Model Municipal Noise Control By-law NPC-131.) These include indoor and outdoor noise standards which, although somewhat different from C.M.H.C. standards because different time periods are used, essentially produce the same results.

Under The Planning Act municipalities are authorized to produce official plans which provide general statements on the goals and objectives of the municipality. It also

authorizes a municipality to produce a zoning by-law, and control development through the Subdivision Control and Site Plan Process.

Official Plans should contain statements related to noise pollution. Some noise mitigation measures such as the arrangement of land uses and spatial separation must be considered at this level.

For many municipalities, Secondary Plans form part of the Official Plan process. More detailed noise abatement policies can be included at this level. It is possible to plan for control of noise at a smaller geographic scale than the neighbourhood through the Subdivision Control Process, and the Zoning By-law and the Site Plan Approval Process.

Railway facilities which are no longer needed or are interfering significantly with the functioning of a municipality can be relocated under the Railway Relocation and Crossing Act. The purpose of this Act is to "facilitate the relocation of railway lines or rerouting of railway traffic in urban areas and to provide financial assistance for work done for the protection, safety and convenience at railway crossings." Municipalities initiate the relocation schemes. There has been heavy municipal response to this program.

Under this Act and the Railway Crossing Fund, financial assistance is available to municipalities to improve railway crossings.

It does not appear that new legislation is needed to ensure adequate control of negative rail impacts. However, existing legislation, particularly that relating to land use planning, could be much better utilized to control negative railway impacts.

PROGRAMS SECTION
G. McAlister, Manager
F. Martin, Senior Planner
July 3, 1980.

REFERENCES

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Jones, H.W., ed., Noise in the Human Environment. Volume 1. Environment Council of Alberta.

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Poon, Larry C.L., The Effect of Railway Externalties on Residential Property Values. University of Western Ontario, Department of Economics. London, Ontario. February 1977.

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Walker and Fields, Preliminary Results from a Survey of the Effects of Railway Noise on Nearby Residents. Institute of Sound and Vibration Research. United Kingdom.

APPENDIX - TERMS OF REFERENCE

TASK: Assessment of Railway Impacts on Adjacent Land Uses

PURPOSE: To determine which uses should be encouraged of discouraged adjacent to rail operations

To establish development criteria for land uses adjacent to railway operations

OUTPUT REQUIRED:

I. Assessment of impacts of railway operations on adjacent land uses.

An analysis to be done of these rail impacts: (positive and negative features)

Noise
Vibration
Air Pollution
Safety (i.e. accidents spills)
Community impact (social economic)
Visual/perceptual
(any other identified impacts should also be analyzed)

The analysis of impacts should include:

(i) Description of the impact

(ii) Methods or criteria for measurement

(iii) Impact on human activity

(iv) Impact on various land uses:

- residential (varying densities)
- commercial (specific types)
- industrial (specific types)
- open space/parkland
- institutional
- agricultural
- other uses

N.B. Different types of rail activities result in different impacts e.g., freight operations vs. commuter transit.

Suggested Sources:

1. Local Planning Policy Branch
2. MOE
3. CMHC
4. Railway Companies
5. References e.g.

- Armour, A. & R. Lang, "Impacts of Urban Railways" Research Report No. 59, University of Toronto/ York University Joint Program in Transportation April 1979.

- Jones, H.W. "Noise in the Human Environment" Volume 1, Environment Council of Alberta.

- Poon, Larry C.L. "The Effect of Railway Externalities on Residential Property Values" (London, Ontario: U. of Western Ontario Department of Economics, February 1977) (now with MTC - 5 - 3744).

II. An analysis of impact abatement measures. (for negative impacts)

The following questions should be answered:

(i) What types of abatement measures have been identified and implemented for the negative rail impacts?

(ii) Give examples of locations where these measures have been implemented?

(iii) How effective have these measures been in mitigating impacts?

(iv) Cite specific examples of effective and ineffective abatement measures.

(v) What other (new) measures can be suggested for rail impact abatement?

III. For positive impacts:

(i) Give examples where rail operations have had positive impact.

(ii) How can this positive impact(s) be promoted, enhanced or encouraged?

(iii) Provide examples of situations where positive impacts have been encouraged or promoted.

Suggested sources (for Section II & III)

1. Local Planning Policy Branch
2. MOE
3. CMHC
4. References (as above)

NB FOR SECTION I, II AND III, THE ANALYSIS SHOULD BE A SUMMATION OR SYNTHESIS OF EXISTING PUBLISHED INFORMATION, RESEARCH OR GUIDELINES.

IV. Identification of Appropriate Uses

A. In view of the impacts and the methods of mitigating or "enhancing" these impacts, what types of land uses would be appropriate for location adjacent to various rail facilities, such as:

rail corridors
commuter stations
rail public transit stations and lines
railway terminals
railway marshalling yards
etc.

NB A rational for why the various uses are considered to be appropriate should also be included.

B. What conditions (if any) should be placed on these land uses (e.g. design standards, setbacks, buffering)?

Suggested Sources
- Local Planning Policy Branch
- Community Planning Review Branch
- MOE
- CMHC
- Consumer & Commercial Relations (Bldg. Code)
- MTC

V. Legislative Framework

A. What legislation or policies now exist that ensure that negative rail impacts are minimized?

B. Are there any changes to policy or legislation required to ensure negative rail impacts are minimized?

Suggested Sources: Legal Services
LPPB
MOE
MTC
Consumer & Commercial Relations
Railway Companies

Task to be Assigned to:

Ministry of Housing

Deadline

June 6, 1980

URBAN DEVELOPMENT

REPORT ON

ONTARIO RAILWAY RELOCATION STUDIES

PREPARED BY MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

FOR

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY

JUNE 1980

- 1 -

ONTARIO RAILWAY RELOCATION STUDIES

I. BACKGROUND

A. Before Federal Legislation

The Railway Grade Crossing Fund was established by the Federal Government in 1909, as part of the Railway Act. It was to help finance work done for the protection, safety and convenience of the public at railway crossings.

Railways have influenced the development of Cities and Towns throughout the Province and also the prosperity of different areas. In many instances, they now bisect municipalities, creating problems for redevelopment, noise, transportation impediments and safety hazards. In some cases they occupy prime urban land that could be redeveloped to improve the quality of urban life.

Over the years, the cost of providing safe railway crossings has drastically increased, especially in the larger centres where major grade separations are now necessary.

In the late 1960's the Province through the then Department of Highways subsidized several feasibility studies of railway relocation or re-routing. Funds were not available from the Federal Government for study or implementation however it was felt that an examination of the rail system was warranted due to the future Provincial funding and possible changes to the existing road system that would be necessary if the railways remained as they were. The original rail feasibility studies were strictly transportation oriented. Early preliminary studies were done in Niagara Falls (1965), Brantford (1963), North Bay (1972), St. Thomas (1972), Sault Ste. Marie (1973), Sudbury (1973), Thunder Bay (1972), Windsor (1972), London (1973). The Province withdrew its support for such studies around 1973 since at the time, there was no commitment for assistance from the Federal Government.

Railway relocation actually took place in other areas of the Province but were done as a result of direct Federal funding and/or rail company involvement. Ottawa had relocation and it also took place when the St. Lawrence Seaway was built and in the Welland area as part of the canal project. Specific details are not available.

In 1974, the Federal Government introduced the Railway Relocation and Crossing Act which included two elements. It expanded the existing Railway Grade Crossing Fund making additional funds available in that area and extended special assistance for major projects at rail crossings. The other element dealt with railway relocation and rerouting. It allowed the Federal Government for the first time to fund and support the planning and implementation of rail relocation or rerouting as proposed by the Province.

The Act stated that up to 50% funding was available from the Federal Government for study and implementation. There were to be three major components to each study. The first, an Urban Development Plan to be financed and administered through the Federal Ministry of State for Urban Affairs. The second was a Transportation Plan to be financed and administered through the Federal Ministry of Transport. A Financial Plan was to show how all costs were to be apportioned and indicate the necessary financial assistance by agency involved, based on a "net cost" formula stated in the Act. Upon completion of a Study an Application to fund implementation must be submitted by the Province to the Canadian Transport Commission for their consideration and approval.

B. <u>After Federal Legislation</u>

The Federal Government created much interest in Railway Relocation in presentations and discussions with Municipalities and Provinces across Canada, indicating the new Federal funds available and the advantages suggested by relocation. Ontario was approached by tenety-one Municipalities that indicated an interest in carrying out a Study. These were:-

Belleville	Niagara Falls	Trenton
Brantford	North Bay	Sudbury
Cambridge	Pembroke	Toronto
Hamilton	St. Catharines	Victoria Harbour
Kitchener	St. Thomas	Waterloo
London	Sault Ste.Marie	Whitby
Moore Township	Thunder Bay	Windsor

Numerous meetings were held between the Federal and Provincial Governments to establish a process to carry out the joint studies. The major outstanding issue at the time was the unknown cost and associated

- 3 -

problems to implement a relocation project. The affect of the "net cost" formula was not known on the many components now included, such as land values, transportation and rail costs etc. Because of this major outstanding issue, the Province indicated that it would share only the funding of five pilot studies of Railway Relocation.

Choosing the five pilot projects was a lengthy process. The Provincial Municipal Liaison Committee was involved and many other major issues were considered by the Province through the Ministry of Transportation and Communications, the Ministry of Housing and the Ministry of Treasury, Economics and Intergovernmental Affairs. Some of the criteria used were:

- Extent of the problems created by the existing rail lines:-
  at grade crossings, new grade separations required, barrier affects, blighted areas etc.

- Status of existing plans:-
  Official Plan, Transportation Plan etc.

- Opportunities if relocation were to take place:-
  vacated lands may or may not be useful, affect on transportation system, new development potential and industrial relocation.

- Affect on Finances:-
  affordable by the Municipality and affordable by the Province.

- Feasibility of relocation:-
  numbers of railways involved, extent of the railway networks etc.

- General estimate of cost of railway relocation if available:-
  bypasses very expensive and financial benefits to relocation.

- Extent of Municipal commitment to Railway Relocation:-
  previous enquiries or work done.

The list of the most suitable municipalities was narrowed to eight and considered by the Municipal Liaison Committee. After further deliberations by the Province, it was announced in June 1975 that the Province would fund five pilot projects of Railway Relocation. The five chosen were Brantford, Niagara Falls, North Bay, Sudbury and St. Thomas. St. Thomas later withdrew their application for study funds.

The joint Federal-Provincial Program was to be funded 50% Federal, 37½% Provincial and 12½ Municipal. Since there was no factual information available on implementation costs, the Province stated that funding was for these pilot projects only and did not commit itself to implementation funding.

The responsibility of co-ordination and funding was vested with the Ministry of Transportation and Communications in co-operation with the Ministry of Housing and the then Ministry of Treasury, Economics and Intergovernmental Affairs.

Co-ordinating Committees were formed with each municipality with representation from the Federal Government and the Province. M.T.C. is funding the Provincial share of the studies and oversees the Transportation and rail components. The Ministry of Housing is involved in the Urban Development Plan. The Ministries of Treasury, Economics and Intergovernmental Affairs are not directly involved but are kept informed as studies proceed. Their participation will be necessary during the discussions and considerations of funding at the completion of each study.

C. <u>Changes to Federal Legislation and Funding</u>

Major changes in Federal funding were announced in 1977 with the introduction of the Urban Transportation Assistance Program (UTAP). The Federal Government announced that $16.5 million per year for five years would be made available to Ontario to cover funding of the following:

- all railway grade separation work
- rail relocation studies
- implementation of the studies
- commuter rail assistance
- urban transportation assistance

The announcement of UTAP caused great concern in the Province since the Federal funds fell short of the amount that Ontario required for work on grade crossings alone. The lack of funds further removed the possibilities of railway relocation studies and implementation. Further consultations were held with the Ontario municipalities in the Federal Provincial Relocation Program and it was decided that the four pilot studies would proceed and that funding of implementation would be addressed at the completion of each study when factual cost information was available.

The Brantford Study was the last to begin and the $75,000.00 Federal share of study costs is funded through UTAP. North Bay, Sudbury and Niagara Falls study funds were committed prior to UTAP and are funded separately. Now that the Federal Ministry of State for Urban Affairs has been abolished, Transport Canada is the only Federal Ministry directly involved in Railway Relocation.

II. FEDERAL-PROVINCIAL STUDIES UNDERWAY

A. Sudbury

In 1972, the City of Sudbury completed a preliminary study of rail relocation. The Study now underway will be completed by the fall of 1980.

1. Existing Rail System:

   CPR has three routes within the City of Sudbury. The main route (Cartier Sub) is double track bisecting the City southeast to northwest. A main yard and terminal is located adjacent the the Central Business District. This is part of the CPR trans-continental main line. Another CPR line enters the City from the southwest and connects in the downtown yard. A third route enters the City from the west from Creighton and also connects in the downtown yard.

   CNR passes through the northern part of the City from the East and interchanges with the CPR at Gilmar Street north of the CBD.

   The International Nickel Company Railway (INCO) has electrified lines northwest of the City. It does not affect the City of Sudbury however INCO generates large volumes of rail traffic that uses the CNR or CPR routes through the City.

2. Objectives of Study:

   The Study is examining the feasibility of re-routing all traffic to the northern part of the city and removing the CPR yards adjacent to the CBD. Consideration is also being given to consolidating CNR on CPR through the City.

3. Proposed Benefits:

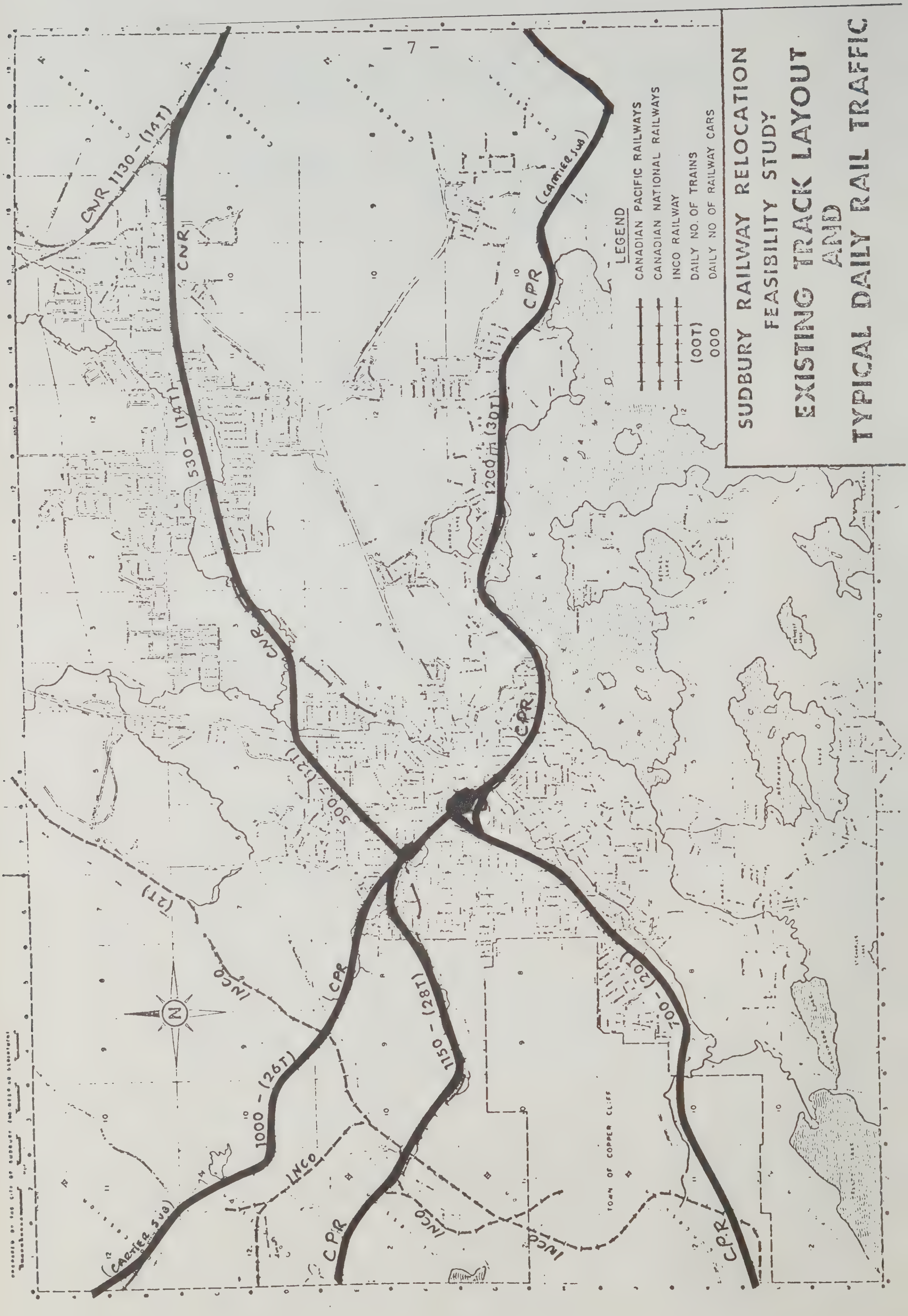
   The removal of the dotown marshalling yards will allow improvements to the CBD. Several uses of the vacated land have been considered for urban

improvement. A new road connection has been suggested along the CNR right-of-way if vacated.

There are presently 33 at-grade crossings in the City and relocation could reduce the present delays and improve safety. Traffic circulation would be improved along with improved access to areas now isolated by the tracks.

4. Present Status:

At the present time in the study process, a rail bypass and/or yard relocation does not appear reasonable. Due to the low growth forecasted in the commercial and residential sectors, the benefits of relocation do not appear to be enough to warrant the associated high costs of relocation. The economic analysis is presently underway but it appears that it will be some time before rail relocation becomes feasible.


- 7 -
SUDBURY RAILWAY RELOCATION
FEASIBILITY STUDY
EXISTING TRACK LAYOUT
AND
TYPICAL DAILY RAIL TRAFFIC
LEGEND
CANADIAN PACIFIC RAILWAYS
CANADIAN NATIONAL RAILWAYS
INCO RAILWAY
(00T) DAILY NO. OF TRAINS
000 DAILY NO OF RAILWAY CARS
CNR 1130 - (14T)
CNR
530 - (14T)
CNR
500 - (12T)
(12T)
1200 - (30T)
CPR
(CARTIER SUB)
CPR
1000 - (26T)
1150 - (28T)
700 - (20T)
INCO
CPR
(CARTIER SUB)
C.P.R.
C.P.R.
TOWN OF COPPER CLIFF

B. Niagara Falls

The City of Niagara Falls completed a prelimiary study of railway relocation in 1966. The present study should be completed by the fall of 1980.

1. Existing Rail System:

The Penn Central Railway (Conrail) crosses the Naigara River from the U.S.A at the intersection of Bridge Street and River Road in Niagara Falls. It travels through the downtown and tourist area southwesterly towards Welland. This main line connects New York and Detroit. There is also a small industrial spur in the downtown and a marshalling yard south of McLeod in an industrial area (Montrose Yard).

The CNR cross the Border at the same bridge as Conrail and travels northwesterly towards St. Catharines. It is the main line connecting Niagara Falls, the U.S.A. and Toronto (Grimsby Sub). The CNR Stamford Sub enters the City from the southwest and serves industry along its length. It joins the Grimsby Sub at a marshalling yard near the Niagara River whirpool. About 80 acres of land formerly used for repair and yard services are presently owned by CNR adjacent to the downtown.

2. Objectives of the Study:

The Study is examining the removal or partial removal of the Conrail line and other lines in the downtown. The tourist area is of major concern and some residential areas could be affected.

3. Proposed Benefits:

If rail lands were vacated, the Tourist area would be easier served and would allow better access to the park along the river. Grade separations are presently required and relocation could eliminate some of the needs. Road and rail conflicts would be reduced.

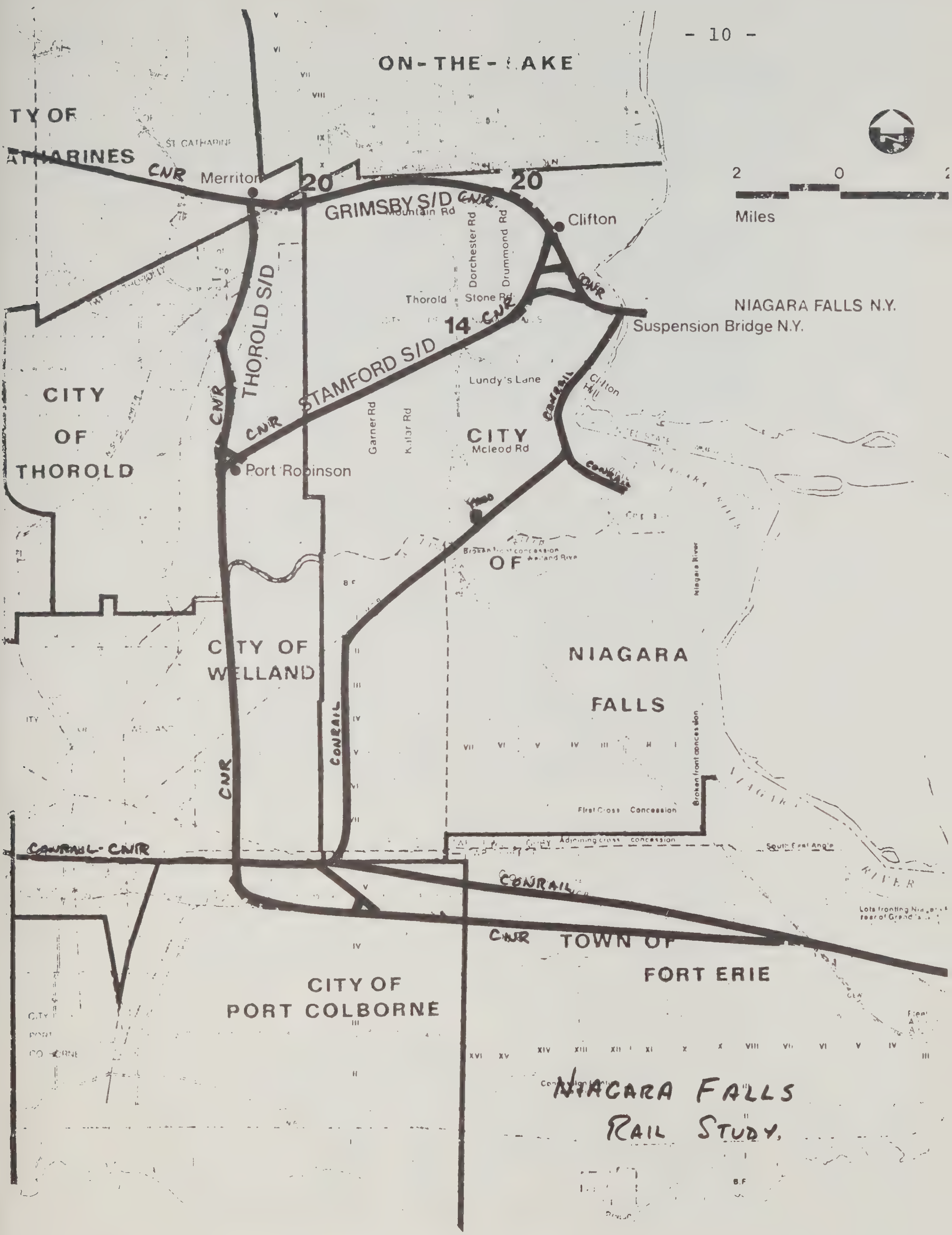
4. Present Status:

At the present time complete railway relocation in Niagara Falls does not appear feasible. Industrial service by Conrail must be maintained to Nabisco in the downtown and the small amount of land vacated creates very few benefits.

- 9 -

Any relocation proposal means new rail facilities through prime agricultural land. The Niagara Escarpment will have to be crossed which causes major concerns. Partial re-routing of traffic from the Stamford Sub through Thorold may be possible but offers very little relief to the Conrail problems in the downtown. The Study is presently considering the Thorold re-routing. It is expected that Public reaction will not be favourable and present indications are that it will be some time before relocation appears reasonable in Niagara Falls.

- 10 -


ON-THE-LAKE
TY OF
ATHARINES
CNR
Merritton
20
GRIMSBY S/D CNR
Mountain Rd
20
Clifton
Dorchester Rd
Drummond Rd
Thorold
Stone Rd
CNR
NIAGARA FALLS N.Y.
Suspension Bridge N.Y.
14 CNR
STAMFORD S/D
THOROLD S/D
CNR
CITY
OF
THOROLD
CNR
Lundy's Lane
CONRAIL
Clifton Hill
Garner Rd
Kalar Rd
CITY
Mcleod Rd
Port Robinson
CONRAIL
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NIAGARA
FALLS
CITY OF
WELLAND
CONRAIL
CNR
First Cross Concession
CONRAIL-CNR
CONRAIL
CNR
TOWN OF
FORT ERIE
CITY OF
PORT COLBORNE
2
0
Miles
NIAGARA FALLS
RAIL STUDY.

LEGEND

C. Brantford

Preliminary work on railway relocation was done in Brantford as part of an overall Transportation Study in 1976. The present study will be completed by the fall of 1980.

1. Existing Rail System:

The CNR has three subdivisions passing through the City. The Dundas Sub enters from the northwest, swings southerly and exits in the northeast. The Burford Sub comes in from the west, crosses the Grand River and parallels Clarence Street to join the Dundas Sub. The Dunnville Sub enters the City from the west and joins the Dundas Sub near Clarence St. A substantial CNR Yard exists in the area of West and Wadsworth Streets.

Lake Erie and Northern **Railway** (LENR)

This railway enters the City from the northwest, follows the north bank of the Grand River to a freight yard on the east side of the river towards the downtown.

Toronto Hamilton and Buffalo Railway (TH & B)

The Waterford Subdivision enters from the west, travels through the City where it exits in the east in the vicinity of Colborne Street East. TH & B operate a freight yard in the vicinity of Eagle Avenue and Newport Street.

2. Objectives of the Study:

Relocation will reduce the large number of at grade crossings within the City. Accessibility to the downtown could be improved from all directions. The physical barrier created by the tracks, especially in residential areas could be reduced.

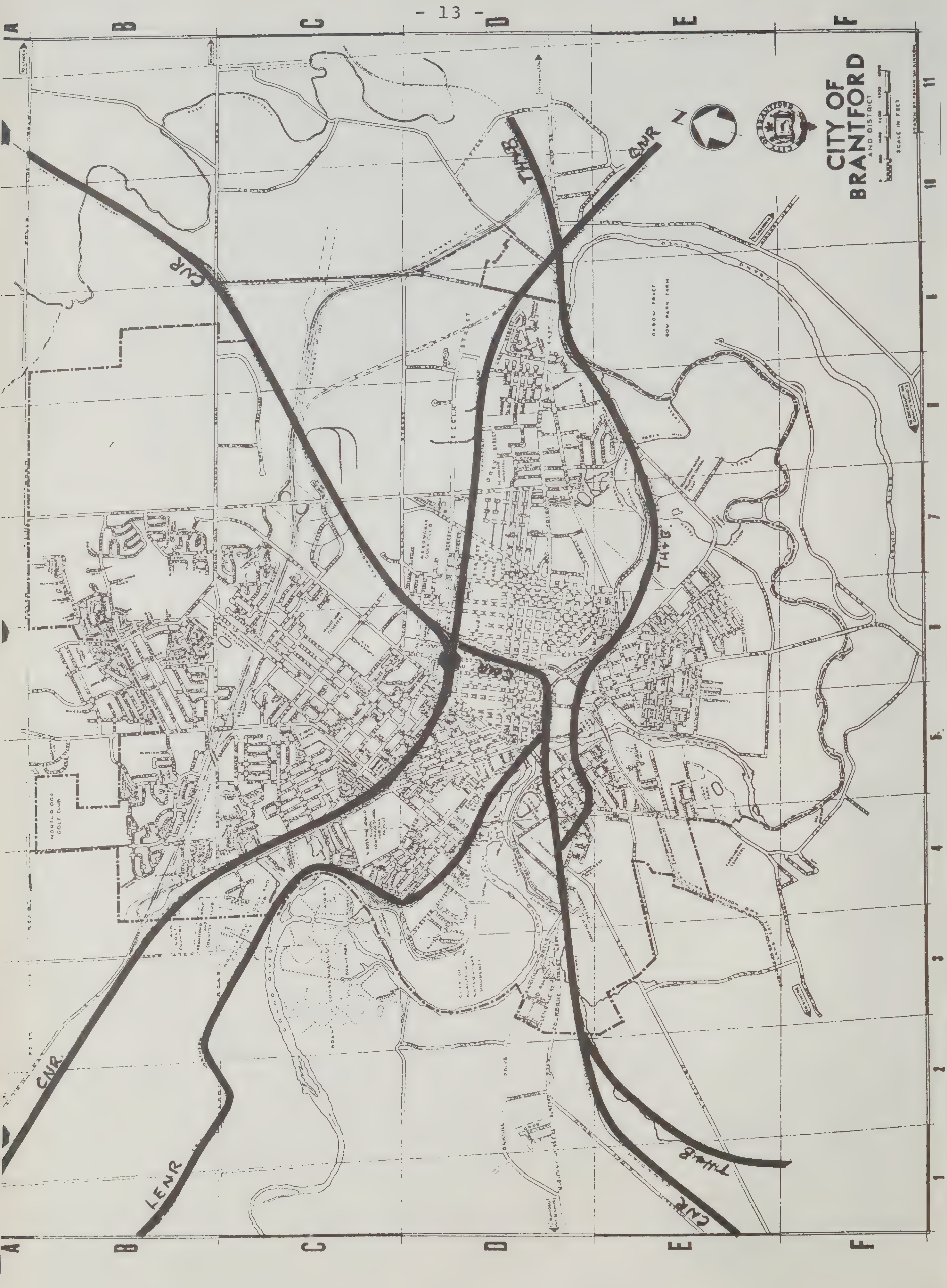
3. Proposed Benefits:

Lands released as a result of relocation could be used for other purposes (residential, commercial). Substantial saving could result by eliminating the need for a number of future grade crossings and work at level crossings. This would also reduce the delay and danger to vehicular and passenger traffic. The release of lands would also allow trans-

portation improvements to the toad system necessary for the City's downtown planning objectives and revitalization.

4. Present Status:

The evaluation of three rail schemes is presently underway. Final costs are not available but preliminary figures indicate that relocation may be feasible. The CNR committed itself to building a rail bypass from the Dunville Sub to the Dundas Sub several years ago to improve their movements from the Nanticoke area. The City has been dealing with CNR for some time. Implementation appears feasible but will only be known when the detailed benefits and costs are completed later this year.


- 13 -
CITY OF BRANTFORD
AND DISTRICT
SCALE IN FEET
CNR
TH&B
LENR
ARROWDALE GOLF CLUB
NORTHRIDGE GOLF CLUB

D. North Bay

The City of North Bay has been the first rail study completed under the Federal Provincial Program.

1. Existing Rail System:

   CPR is a single main line track through the City that follows the shoreline of Lake Nipissing. A large CPR yard is located on 50 acres of land between the Lake and the downtown area.

   CNR travels through the City on a single elevated main line. A passenger station shared with the ONR is situated on Fraser Street. They have a 20 acre transfer yard in West Ferris.

   The Ontario Northland Railway (ONR) runs through the City in an easterly direction. Their yard is on a 75 acre site south of John Street and includes marshalling, transfer, storage repairs and maintenance facilities. ONR headquarters are in North Bay.

2. Objectives of the Study:

   The study examined the advisability and method of relocating some or all of the rail lines and yards.

3. Proposed Benefits:

   The City wanted to free up about 50 acres of rail land on the waterfront for redevelopment and improve public access to the waterfront. Numerous new and re-constructed grade separations are presently required and relocation would reduce the number and also the conflicts at rail crossings.

4. Present Status:

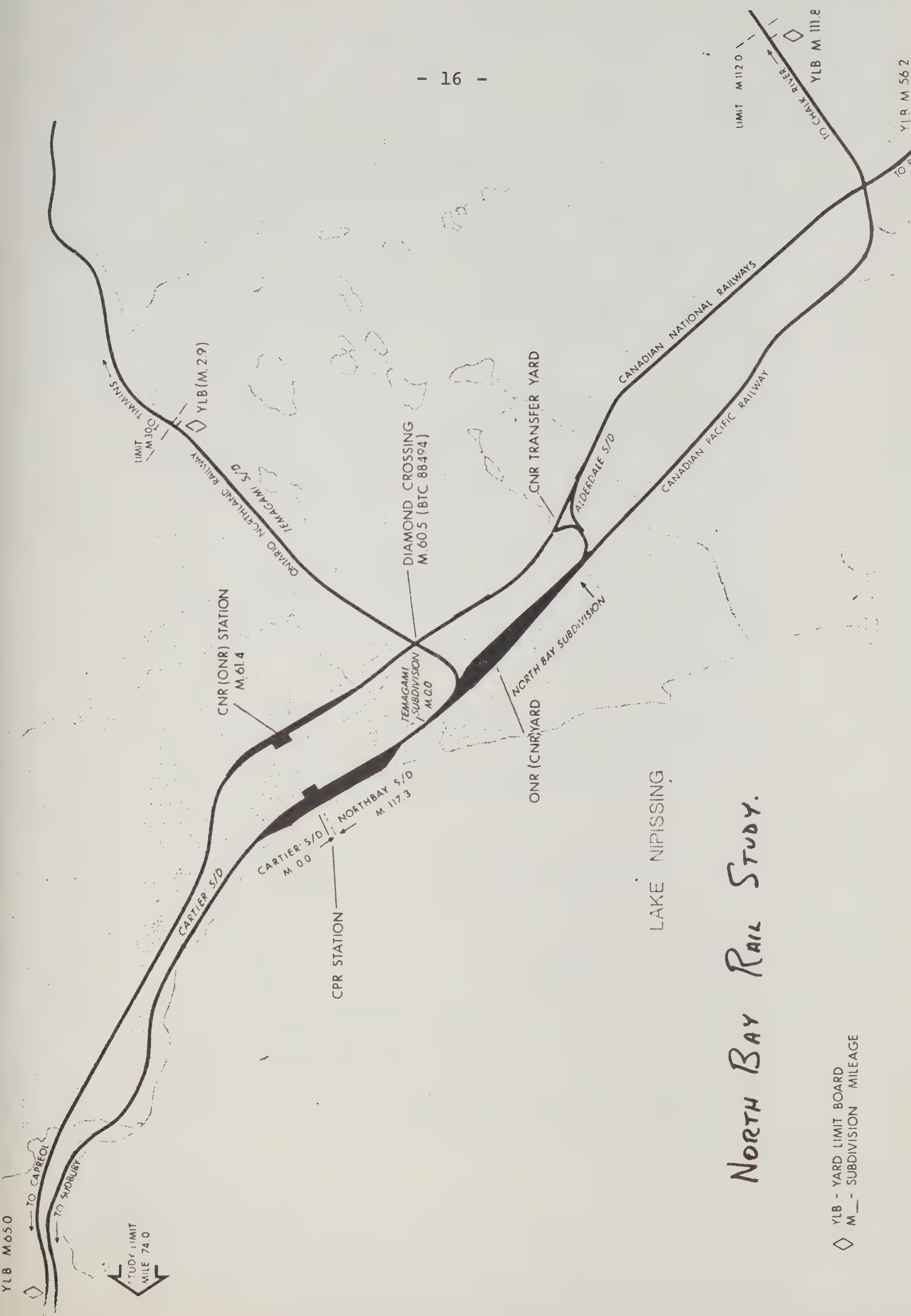
   1. relocate the CNR main line including the relocation of the CNR transfer yard

   2. relocate the CPR Yard from the waterfront to a site between Marshall Avenue and Birch's Road

The study has indicated that if railway relocation is to be implemented the net cost would be approximately $8,000,000. If the rail system remains "as is" the total costs for new grade separations and associated work is approximately $11,000,000.

The suggested cost sharing of implementation is $4,000,000 Federal, $2,000,000 Provincial, and $2,000,000 Municipal.

Meetings are presently being held with the Ministry of Transportation and Communications, the Ministry of Housing, the Ministry of Treasury and Economics and the Ministry of Northern Affairs to establish a Provincial position on funding the implementation of the North Bay Study.


NORTH BAY RAIL STUDY.
LAKE NIPISSING
TO CAPREOL
TO SUDBURY
YLB M65.0
STUDY LIMIT MILE 74.0
TIMMINS
LIMIT M3.0
YLB (M.2.9)
ONTARIO NORTHLAND RAILWAY
TEMAGAMI S/D
DIAMOND CROSSING M.60.5 (BTC 88494)
CNR (ONR) STATION M.61.4
CNR TRANSFER YARD
ALDERDALE S/D
CANADIAN NATIONAL RAILWAYS
CANADIAN PACIFIC RAILWAY
NORTH BAY SUBDIVISION
ONR (CNR) YARD
TEMAGAMI SUBDIVISION M.0.0
CARTIER S/D
CARTIER S/D M 0.0
NORTHBAY S/D M 117.3
CPR STATION
LIMIT M 112.0
TO CHALK RIVER
YLB M 111.8
YLB M 56.2
YLB - YARD LIMIT BOARD
M_ - SUBDIVISION MILEAGE

III. PROVINCIAL INTERESTS

A. Many issues and problems are examined as part of a railway relocation study that have direct and indirect affects on the Province. One of the major items is the use to be made of released railway lands. If land is released in the downtown area it will allow for more orderly development of the area through many innovative improvements. Further strengthening of the downtown will also be possible. Urban blight will be improved and the potential for other land uses if warranted will be increased.

Released land in residential areas will allow for other uses along the R.O.W., such as bicycle paths, walkways and lot extensions etc.

Any land use changes will likely involve the Official Plan process which will ultimately mean Provincial dealings.

Removal of rail lines and/or yards could result in improvements to traffic circulation. Roads formerly cut off by rail lines could be made continuous which would improve the transit routings and emergency vehicle access to neighbourhoods. Communities would be made whole, and noise and pollution would be improved.

Provincial funding of grade separations could be affected. If the rail system is to remain "as is" numerous new grade separation may be required. Relocation may reduce the grade separation requirements and therefore Provincial funding.

Many Municipalities are unaware of the relocation costs and benefits, whether negative or positive, until a Study is completed. A relocation study will examine the feasibility and the associated costs and if found to be unreasonable the Municipality can proceed knowing that all future plans and work will have to include the rail system in its present location.

Redevelopment as a result of relocation may allow a Municipality to take advantage of other Provincial programs, i.e. Downtown Revitalization etc. In some cases the railways may benefit from relocation. Existing routes could be made shorter and railway operating and maintenance costs could be reduced.

B. Future Studies

No commitment for further studies has been made by the Province and present Federal funding through UTAP is not sufficient to continue the program. Some of the municipalities awaiting study funding that are more applicable to the program are as follows:

Cambridge:

Recent enquiries have been made on study funding however at the present time it is unknown what is proposed.

Hamilton:

Relocation has been considered for many years. Ferguson Avenue and the Stuart Street Rail Yard are the major concerns but further details are not available.

Kitchener:

Some preliminary work has been done by the City but the results are unknown. Any relocation in Kitchener would have to be carried out through the Regional Government.

London:

Railway relocation was considered in 1973 on a preliminary basis as part of Phase I of a Transportation Study. The conceptual rail scheme suggests relocation to the south of the City. Detailed evaluations have not been done.

Pembroke:

This Municipality has requested financial assistance from the Province on different occasions. They propose to consolidate the CPR line on the CNR line that travels 2 miles south of the City. Ten road-rail crossings will be eliminated and river-front lands will be made more accessible. The use of the vacated right-of-way has been suggested for a scenic riverside drive.

St. Thomas:

This was one of the five municipalities chosen to proceed with a pilot study however they later withdrew their application. A preliminary study was

done in 1972 that recommended relocation of all the rail lines to an area north of the City. St. Thomas has not indicated further interest since withdrawal of their application.

Sault Ste. Marie:

A preliminary study was done here in 1973. It recommended relocation of the CPR mainline north of the City. Sixteen rail/road crossings could be eliminated. It was suggested that the vacated right-of-way would be used for a new arterial road.

Thunder Bay:

A preliminary study was completed in 1972. In 1979 a further review was done. The study recommended that CNR be located in the existing CPR corridor, and the development of a new grain terminal. $40 million is the recent cost associated with relocation.

Waterloo:

The City wished to pursue railway relocation some time ago and enquiries have been made recently. Any study would have to be done on a Regional basis similar to Kitchener.

Windsor:

Windsor continues to request study funds for railway relocation. Preliminary work was done in 1972. Several relocation schemes were examined however implementation will be very complex since seven rail companies presently operate in the City.

IV. PROVINCIAL ROLE

The role the Province should play in funding implementation is presently being addressed. The North Bay Study has been completed for approximately one year and whether or not Provincial funds should be made available will be included in a suture submission to Cabinet. Each of the four pilot studies will be dealt with separately since each will have different recommendations and will have dealt with different specific problems in that municipality.

Before a Federal commitment is made to funding, whether it is through UTAP or not, a Provincial position must be stated on funding and overall costs. Once this position

is established, an application can be forwarded to the Federal Government requesting their commitment for implementation funds.

A precedent for funding railway relocation implementation in Canada has not been set, and no one is aware of what additional requirements might be required by the Federal Government. A Hearing before the CTC will be necessary and to this point in time there has not been formal involvement of the Railways. The cash flow and up front funding will have to be addressed and an implementation Agency discussed. Resolution of these issues will only be resolved after general Provincial and Federal commitments are made on funding and must be done as a joint effort between the two levels of Government.

The options presently being considered by the Province are as follows:-

- No Provincial funding towards railway relocation.
- 25% Provincial funding conditional on the 50% Federal share being a separate fund from UTAP
- Unconditional Provincial approval at 25%
- Provincial approval in stages as implementation proceeds
- Total Provincial funding with no Federal involvement

Other options may be considered as work proceeds however, the eventual submission to Cabinet will be a joint document prepared by several Ministries. This will ensure that their specific concerns have been discussed before finalization of the Provincial position on implementation funding.

Whether or not further studies will be done in Ontario depends on the amount of funds that may be made available to implement the plans. Since each Municipality addresses different problems that cost varying amounts to realize the benefits it is not possible to determine specific needs until the plans are near completion, which is almost at the end of the study process.

urban development & railway rationalization

Ontario Ministry of Housing

Project Planning Branch

July 1980

URBAN DEVELOPMENT AND RAILWAY RATIONALIZATION

Prepared for the Ontario Task Force on Provincial Rail Policy

Ministry of Housing
Project Planning Branch
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TABLE OF CONTENTS

Table of Contents - Continued

Table of Contents - Continued

LIST OF TABLES

LIST OF FIGURES

1.1

URBAN DEVELOPMENT AND RAILWAY RATIONALIZATION

1. INTRODUCTION

In early June the Project Planning Branch of the Ministry of Housing was asked by the Ontario Task Force on Rail Policy to prepare a report on "Urban Development and Railway Rationalization". Because of the relatively short time that was available to research this subject (draft report by July 11th, 1980; final report by July 31, 1980) the task was generally designed to be impressionistic and conceptual rather than in-depth and detailed. Nevertheless, a number of significant observations emerged from the work.

The task methodology, as provided by the Task Force, involved three main phases: Phase I - Existing Situation; Phase II - Opportunities for Rationalization and Revitalization; and, Phase III - Policy Directions (Provincial Role). This report essentially follows this format. The overall purpose of the report was:

i) To determine provincial opportunities in promoting an integrated and efficient rail system in urban centres; and,

ii) To test a methodology for investigating provincial involvement in railway rationalization in urban centres.

In order to identify the various types of opportunities for railway rationalization and revitalization, we used a case study approach was used. The six municipalities within Metropolitan Toronto,* the City of London and the City of Chatham (i.e. representative of large, medium, and small centres) were selected to aid in problem identification. Site visits and meetings with local officials were conducted for each. We analysed the types of problems that were identified in these eight centres together with the existing legislative structure to determine possible opportunities for railway rationalization and revitalization. This in turn helped us to determine possible provincial policy directions to promote more efficient planning for the rail system in urban areas.

Although the report tends to focus on community planning issues, a number of broader issues and opportunities were identified and have been highlighted in the text.

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* City of Toronto, City of North York, Boroughs of: York; Etobicoke; East York; and Scarborough.

2. EXISTING SITUATION

In this section we identify a number of issues about, or impacts of rail lines in Ontario, using a case study approach.

Available data for freight and passenger service was quite limited but such information as we could obtain, we have used in the text.

2.1 METROPOLITAN TORONTO

2.1.1 Existing Rail Lines and Inter-Modal Facilities

The radial pattern of railways in Metropolitan Toronto illustrates the municipality's role as a regional transportation centre. Figure 1 depicts this pattern and the associated rail yards and passenger stations. Most of the lines are owned by the Canadian National Railway (CN). However, the Canadian Pacific Railway (CP) operates one major freight line across Metro from east to west and another from the north-west corner of Metro to Union Station.

Freight services are operated on all of the main lines, and on a network of spur lines which provide access for industrial areas throughout the municipality. Due to lack of data we were unable to determine the number of industries which are dependent on the railways, but it is obvious that freight services are vital to many businesses in the municipality. This is especially true in York, where access to major freeways is limited, and in areas where large industrial parks have developed along the railway, as in Scarborough and East York.

Both CN and CP operate sorting and marshalling yards in Metropolitan Toronto. These include:

- Agincourt Yards, Scarborough (CP)
- Don Yards, Toronto (CN)
- Lambton Freight Yard, York (CP)
- South end of Islington, Etobicoke (CN)
- Kipling at North Queen St., Etobicoke (CP)

These yards facilitate inter-modal freight transfers between rail and truck services. Agincourt is the largest facility within Metro and is comparable to the CN marshalling yards just north of Metro in Maple. Both these facilities handle major piggyback and container transfers. Therefore they are the focal points for freight traffic entering Metro from other regions.

Data available to us on freight traffic was extremely limited. Using estimates provided by the Ministry of the Environment, and through discussions with planners in each City and Borough, we were able to get an impression of traffic levels. Both the CP and CN east/west tracks are heavily used, as are the tracks around the marshalling yards for each company. Traffic on CN lines is generally higher because of the passenger services on them, as discussed below.

Passenger services are offered by VIA and GO transit on the CN lines.* The major depot for both these services is Union Station where inter-modal connections among rail, bus and subway services are made. The GO stations are shown in figure 1. VIA operates additional depots in West Toronto and Agincourt.

The presence of rail facilities and the growing interest in energy efficient transportation makes passenger service an interesting opportunity for government involvement. GO is planning to expand rail service with a Streetsville/Milton route scheduled for 1981. Planners in Metro expressed an interest in improved inter-modal facilities. Scarborough would like to see relocation of the Agincourt VIA station to connect with the proposed LRT line to Scarborough Town Centre. There was some interest in the City of Toronto in relocating the bus terminal to the foot of Bay Street.

There is a possibility of using more lines for passenger services and short-distance commuting. For example, there is some potential for a commuter service to the downtown core from East York. The Borough of York felt that the development of high density residential areas such as the Mount Dennis community will require a new GO station at Eglinton Avenue and Weston Road.

Any expansion of services or facilities would have an impact on the surrounding community, which will have to be weighed against the extra convenience for commuters.

2.1.2 Existing Land Use

Within Metropolitan Toronto, the railway lines are adjacent to a variety of land uses.

Most of this land has been developed for industrial use. The existence of a railway has aided in the development of industrial parks such as the Leaside industrial area in

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* VIA is a federal crown corporation operating passenger services throughout the country. GO is the Government of Ontario transit company which offers train and bus commuter services in the Toronto region.

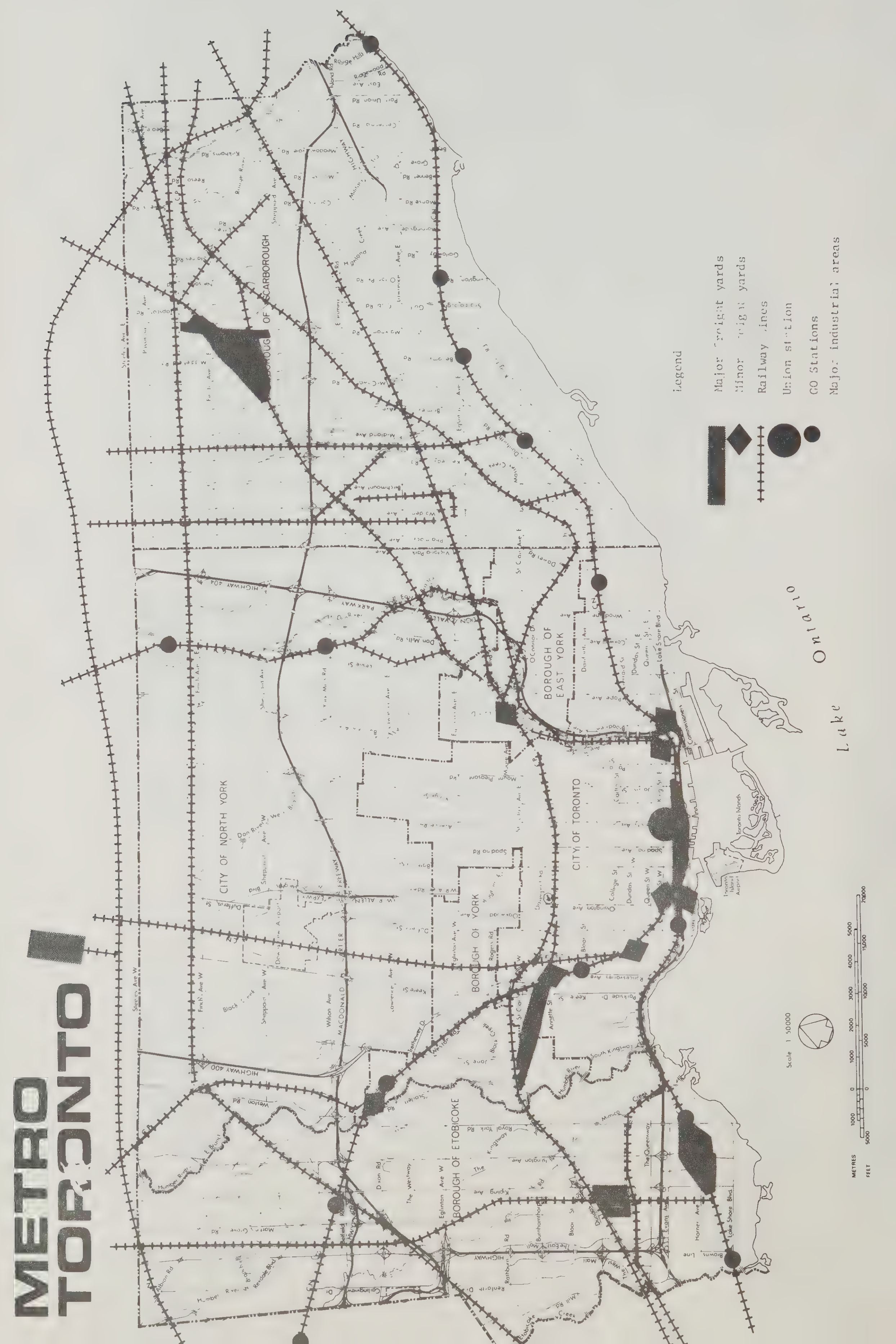
METRO TORONTO
Legend
Major freight yards
Minor freight yards
Railway lines
Union station
GO Stations
Major industrial areas
BOROUGH OF SCARBOROUGH
CITY OF NORTH YORK
BOROUGH OF EAST YORK
CITY OF TORONTO
BOROUGH OF YORK
BOROUGH OF ETOBICOKE
Lake Ontario
HIGHWAY 401
HIGHWAY 400
Scale 1:50000
METRES
FEET

figure 1

East York. Industrial uses along railways are considered beneficial for the industries involved, for the community as a whole, and for the railroad companies. They provide a buffer between railways and residential areas and contribute to the freight usage of the rail lines.

Utility corridors along rail lines are another form of compatible land use. Examples of these include sections of the CP line near the Don Valley Parkway and the CP line in Etobicoke which runs adjacent to a hydro right-of-way.

Problems have arisen in areas where residential development has taken place near rail lines, especially when railway companies wished to expand their services.

The stereotype for residential areas near railways is one of old and delapidated housing. There are many places in Metro which conflict with this image, the most obvious example being the spacious lots and attractive homes in the Rosedale area near the CP line.

The need for developable urban land has resulted in increased use of land near railways for new residential areas. One example of this is the St. Lawrence neighbourhood in Toronto. This development made use of underutilized industrial land for multi-family dwellings, some of which are immediately adjacent to an elevated rail line. In Etobicoke, a 550 unit development is presently under negotiaion near the CN Maple line. A third example is the proposed development west of the Bayview extension in East York.

In addition to developments on vacant lands near railways, there are also examples of development on abandoned rail rights-of-way. The City of Toronto has had extensive experience with this on railway lands along the lakeshore. The shifting of marshalling yards to suburban locations released some land for development. A series of studies of the railway lands have been prepared to design more efficient use of the land and improved public access to the waterfront. At present, development approval has been granted for 6,000,000 square feet of office space on these lands. In York there are plans to make the old 'Belt Line' railway into a linear park.

Planning for these types of developments or for any development near railway lines must take into account a variety of problems that are outlined in the following section.

2.1.3 Identification of Problems and Impacts

Several problems which are both caused and faced by railways can be identified in Metropolitan Toronto. Although the rail lines have had an impact in all areas of Metro, concerns of the six municipalities varied. Each issue leads to pressure on the railway companies which must deal with site-specific problems while operating a national rail system.

This discrepancy in the interpretation of problems between the railway companies and the community has contributed to a larger communication problem. This can be particularly harmful when a municipality is, for instance, considering residential development unaware that the railway is considering expanding services in the same area.

Such communication problems were evident to some degree in each of the specific issues mentioned by Metro planners. These problems are outlined below.

The railways are seen as essential to industrial growth while at the same time they form a barrier to pedestrian and vehicle traffic and to development.

2.1.3.1 Grade Crossings

The impact of the railways on traffic flows varies greatly among the municipalities. East York and North York each have only one railway crossing still requiring grade separation while 19 grade crossings remain on a recent capital works priority list in Scarborough. Table 1 lists the ten highest priority grade separations in the Metro area. Work on these crossings alone will extend into the 1984 budget.

There are several obstructions to solving the grade separation problem. The biggest problem is financing. As outlined in section 2.4, funds for improving crossings are limited. There are difficulties determining the shares various levels of government and the railways should take in financing costly grade separation work. Where funding is available, the application procedure to receive a grant is extensive and may require time and technical expertise beyond what the municipality can afford to allocate to one issue.

Finally there is a dilemma in deciding what constitutes a 'problem' crossing. The Ministry of Transportation and Communications is guided by an 'exposure factor'.* While this may be a good index for comparing needs, it fails to

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* This is the product of the average number of vehicles and trains at a crossing in a twenty-four hour period.

2.5

TABLE 1

METRO TORONTO: Priority List for Grade Separations (First Ten)

Rail Line	Location	Jurisdiction	Remarks
Uxbridge (CN)	Lawrence Ave.	Metro	- Proposed LRT route - Application has been submitted.
Uxbridge (CN)	Ellesmere Ave.	Metro	- Proposed LRT route - 1980 budget - Application being prepared for CTC.
Kingston (CN)	Kennedy Rd.	Scarborough	- 1980 budget - Application being prepared for CTC.
Galt (CP)	Shorncliffe Rd.	Etobicoke	- Proposed GO line - 1980 budget - Application being prepared
North Toronto (CP)	Osler St.	Toronto	- road to be closed - pedestrian overpass application has been sent to CTC.
Kingston (CN)	Brimley Rd.	Scarborough	- 1982 budget - functional study complete
Kingston (CN)	McCowan Rd.	Scarborough	- 1984 budget - on GO line
Galt (CP)	Montgomery Rd.	Etobicoke	- 1984 budget - high pedestrian volume - on proposed GO line
Belleville Cross Connection (CP)	Finch	Scarborough	- included 2 level crossings and 1 single lane structure - 1984 budget

Source: Roads and Traffic Department, Metropolitan Toronto, 1980

2.6

account for particular characteristics of the crossing such as speeds or features of the site and adjacent land uses. It also describes the crossing in terms of present needs only.

In North York, however, most grade separation work was completed before development took place. The lack of grade separation problems in that City is in part due to the use of projected growth in traffic when planning for grade separation work.

2.1.3.2 Railways and Adjacent Development

Where the railways conflict with land development, the issues are much more complicated. The railway companies see residential development near their rights-of-way as an infringement by conflicting land use. It can restrict their ability to expand services and can increase safety and trespassing problems.

As the original landowner in many areas, the railways see themselves as having seniority over new developments and an obligation to provide efficient service to both freight and passenger customers. Therefore, they want restrictions to be placed on residential development. Their guidelines suggest that residential structures should not be built closer than 250 feet from the rail line because of vibration, and up to 1,000 feet because of noise. These restrictions are negotiable.

For example, in East York the council was considering a residential development west of the Bayview extension. CP's objections to the development resulted in the requirement that the developer construct noise-attenuating berms and fences and provide vibration insulation in houses within 250 feet of the railway. In addition, warnings about the limitations of these types of precautions and the possibility of railway expansion must be registered on all land titles and leases. Presumably after this, the law of 'let the buyer beware' prevails.

For their part, the municipalities of Metro Toronto are facing a shortage of land for residential development, a lack of funds to provide noise attenuation devices and an absence of guidelines as to what types of berms, fences etc. are effective. The fact that some developments are taking place points to the possibility of compromises being reached if discussions with the railways take place.

Agreements reached in these examples have concentrated on noise and vibration although other issues may be involved. Most of the planners expressed a growing concern for safety, especially where movement of hazardous goods is involved. Since the Mississauga wreck, the Metropolitan Toronto government is asking for a re-routing of trains

carrying hazardous goods outside of Metro, or at least for more control over the transport of materials through the municipality.

2.1.3.3 Railway Relocation

The idea of relocating the rail lines to alleviate problems they cause was not a major issue in our discussions in Metropolitan Toronto. The planners interviewed were well aware of the importance of rail service to the industries and economy of their jurisdictions. As part of the Toronto Transportation Terminal study, relocation of the 'High Line' freight line in Toronto was considered. The idea was not pursued because of related relocation work that would have to be done. Generally, relocation is seen as too expensive in terms of capital costs, land and efficiency of service.

2.1.3.4 Other Issues

In fact, several suggestions were made for expanding the services offered on existing rail lines. The expansion of the GO system and coordination of commuter services has already been mentioned. An interesting suggestion came from the Borough of York where the Castlefield industrial area was identified as a potential inter-modal truck/rail transfer point for solid waste from the Metropolitan area. There is a need to identify similar potential for existing rail facilities on a regional scale.

Abandoned or under-utilized rail lines were also not a major issue. Railway companies are naturally reluctant to relinquish their future options. They will offer leases for industrial use of unused lands but it is difficult to attract major investment where an industry may only be temporary. There was concern expressed about the lack of maintenance that allows abandoned rail lands to become an eyesore to a community. Here again, the problem of communicating with railway companies was evident.

In summary, while the rail lines provide an essential service they are associated with a variety of problems in the eyes of each municipality. The overriding need is for coordination and guidance in everything from technical issues to obtaining funds. The Province has a potential to fill this need, especially where effective communication with the railways is required.

2.2 CITY OF LONDON

2.2.1 Existing Rail Lines and Inter-Modal Facilities

There are two railway companies operating on four lines within the London Area (see Figure 2). CN (with 21 miles

of main line track and 50 miles of yard and siding tracks) operates 18 passenger trains and 26 freight trains through the City. CP (with 9 miles of main track and 20 miles of yard and siding track) operates 20 freight trains through the City.

CN has three routes into the City of London; the principal route is between Toronto and Windsor-Sarnia; the second route enters the city from the north-east from Stratford; and, the third route comes from St. Thomas. The principal route is a double track that bisects the city from east to west.

The CP line was built to the City in 1887 and was located on the outskirts of the city. As the City grew, development spread around the tracks. The railways obtained space for their freight yards but these also were soon surrounded by the growing City.

The rail system was important to the City's initial development. The rail service offered industries a relatively inexpensive and efficient transportation system. Today, there are few rail dependent industries remaining. These are: Kellogg's, Canadian International Paper Containers, General Steel Ware, St. Lawrence Cement, and Labatts Breweries.

There are both positive and negative features of the freight rail system in London. Noise, vibration and road/rail conflict are the major negative features of the railway. The efficiency of the freight service bringing goods in and out of the City is the major positive feature.

As recommended in the City's "Systems Planning and Railways - Phase I" report, the opportunity for improvement of the existing rail freight movement system is the relocation of the CP main line to the CN corridor, and the removal of both freight yards to the east of the City. All but four industries currently with rail service would continue to be served, by a system of spur lines. Sections freed from rail use, such as the CP line to the north-west, would be available for other transportation uses. This rail relocation would remove the worst effects of train movement through London, while simultaneously providing continued service to rail-dependent industries and supporting a downtown passenger terminal.

The inter-modal rail passenger facility is located downtown. The bus station is located next to the train station, providing an inter-urban bus service to the surrounding communities. For rail passengers stopping in London, there is an excellent intra-urban bus service, one block north of the rail terminal.

VIA's passenger service is a good system providing frequent service acceptable to the people of London. With projected increases in energy costs, VIA could become a viable alternative to the automobile for some trips.

The freight and passenger rail traffic can be summarized by the following table.

TABLE 2

London - Frequency of Rail Service

Train Carrier	Frequency (Trains/Day)
Main CNR Line (VIA)	Freight 26 Passenger 18
Main CPR Line	Freight 20 Passenger 0

Source: Canadian National Railway, 1979
Canadian Pacific Railway, 1979

2.2.2 Existing Land Use

There is a mixture of land use types along the railway. Most of the area along CN and CP tracks in the eastern section of the City is designated industrial. Next to the industrial sector is medium density housing. This causes problems at times because of the noise and vibration caused by the trains.

Along the CN line there are some residential dwellings. A subdivision is located near the CN reclamation yard, where the scrapping of old engines and box cars is done. This use of the land is extremely annoying to the residents, and, it has been suggested that the reclamation yard be removed to outside London. There are some vacant lands west of the CN yards that have potential for development.

The CP line cuts through more residential designations than the CN line because the City grew around the CP tracks. The trains have doubled their speed through this area but there still are complaints from the residents regarding noise, vibration and transporting of dangerous cargo.

The two companies own substantial areas of property in the City, as summarized below:

2.10

TABLE 3

London - Railway Land Ownership

Railway Company	Corridor (Approximate No. Hectares)	Yards (Approximate No. Hectares)	Total (Approximate No. Hectares)
CN	48	52	100
CP	40	27.5	67.5

If relocation were to occur, part or all of these lands could be released to the municipality and a more compatible land use could be established. Presently, there are approximately 850 hectares of property designated as living areas within a distance affected by possible noise and vibration.
The railway corridor has, to a limited extent, restricted the growth of the Central Business District (C.B.D.). CN has studied the potential land use of their lands in the C.B.D. and has proposed commercial development on the south side of the tracks.

In addition, underpasses at Wharncliffe Road and Platts Lane require reconstruction and are to be added to the list.

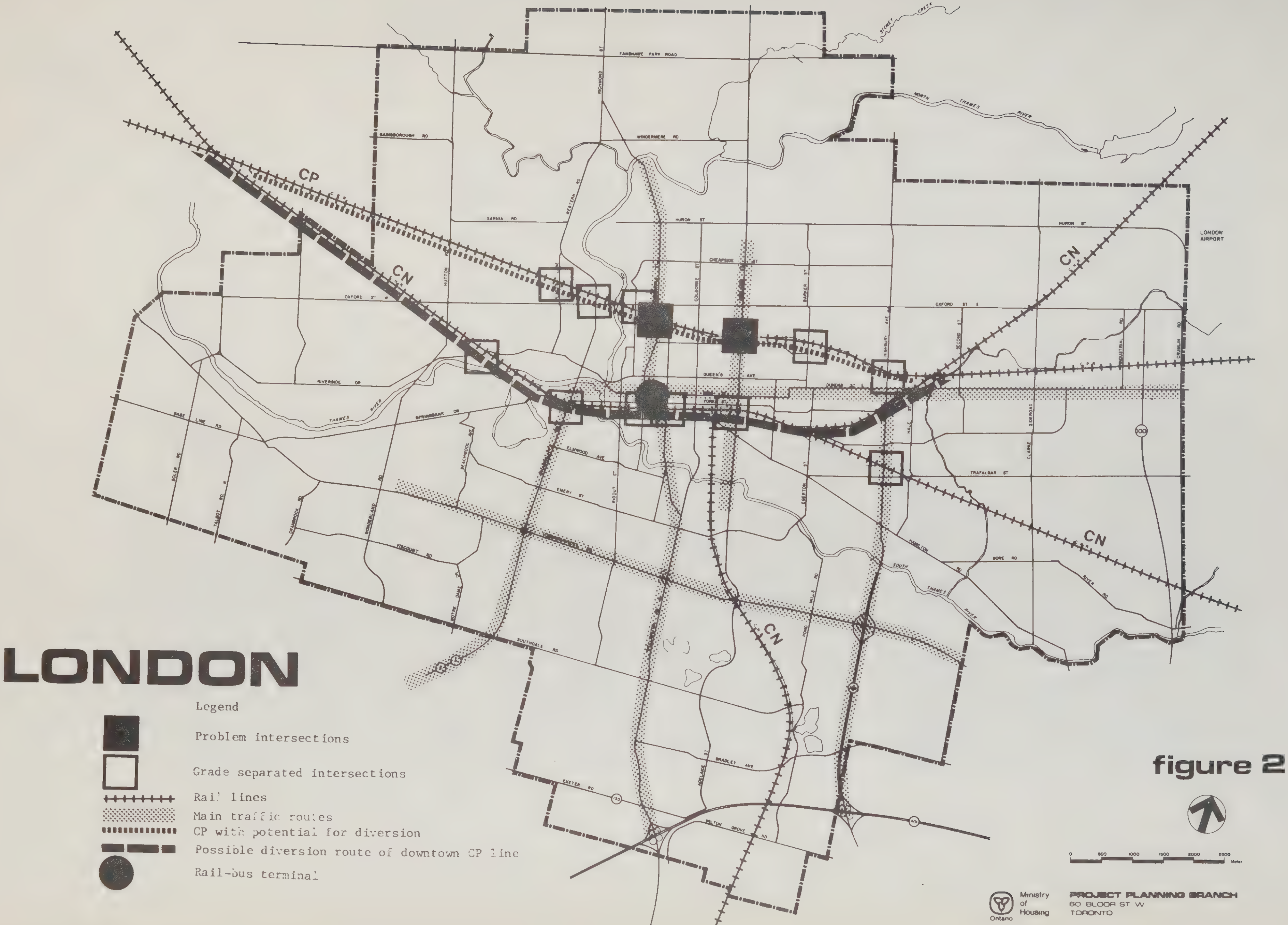
2.2.3 Identification of Problems/Impacts

A major concern of the City in relation to the railway is grade separation. Most of the CN tracks have separated grade crossings in the downtown area, whereas CP has the majority of its crossings "at grade" (See Figure 2). The volume of rail freight movement and traffic demand on the cross streets is increasing every year, thus increasing the inconvenience to a greater number of drivers. Therefore a priority list for grade separation was derived as shown below:

TABLE 4

London - Priority List for Grade Separations

Priority	Street	Railway
1	Adelaide Street	CP
2	Richmond Street	CP
3	Ridout Street	CN
4	Colbourne Street	CN
5	Clarke Side Road	CP


LONDON
Legend
Problem intersections
Grade separated intersections
Rail lines
Main traffic routes
CP with potential for diversion
Possible diversion route of downtown CP line
Rail-bus terminal
figure 2
Ministry of Housing
Ontario
PROJECT PLANNING BRANCH
60 BLOOR ST W
TORONTO
CP
CN
LONDON AIRPORT
FANSHAWE PARK ROAD
WINDERMERE RD
SARNIA RD
HURON ST
OXFORD ST W
OXFORD ST E
CHEAPSIDE ST
QUEEN'S AVE
DUNDAS ST
RIVERSIDE DR
THAMES RIVER
NORTH THAMES RIVER
SOUTH THAMES RIVER
SPRINGBANK DR
TRAFALGAR ST
HAMILTON RD
GORE RD
RIVER RD
SOUTHDALE RD
EXETER RD
WILTON GROVE RD
BRADLEY AVE
VISCOUNT RD
EMERY ST
ELMWOOD AVE

2.11

The priorities for grade separation as stated in Table 4, list Adelaide Street and Richmond Street at the top because these streets are the major thoroughfares of the City. At Adelaide Street and the CP tracks, the most evident road/rail conflict exists. Some motorists have had to wait up to 15 minutes or more for a train to clear. This conflict also affects the routes which emergency vehicles use.

Recently, though, Council passed a resolution, that there will be no grade separation at Richmond Street and the CP tracks. The reason for this is the development of a commercial and high-rise residential core located just north of the tracks.

Other major problems associated with the railway are noise attenuation, vibration and safety. The Province is currently researching the noise and vibration problem to develop standards for future developments along rail lines.

London has a number of plans for the railway lines, one of which is rail relocation. Rail relocation would remove the worst effects of train movements through the city while at the same time providing for continued service to rail-dependent industries. The basic intent is to combine main line traffic from both companies along the existing CN corridor. The centrally-located yards, which at present cause most of the road-rail conflict, would be moved east of London.

The CP corridor would then be identified for protection for an intermediate capacity rapid transit system to be designed for the ultimate population of the City. Similarly, a commuter rail system such as the "Go" Train system in Toronto may become feasible in the London area at some future date.

There are also several other factors that we identified in the London area which need some consideration in railroad relocation:

- loss of agricultural land;
- impact (physical, economic, social) of a change in land uses;
- accessibility to the core for passenger service;
- political venues;
- existing grade separations.

Although the City of London has prepared a report entitled "System Planning and Railways - Phase I", it has not gone into detail as to the implementation of the plan or the impact of the plan on the community. Studies of this nature should be pursued prior to detailed planning for railway rationalization in London.

2.3 CITY OF CHATHAM

2.3.1 Existing Rail Lines and Inter-Modal Facilities

The City of Chatham is presently served by three railway companies (see Figure 3). The CN line runs through the periphery of the core in an east-west direction. The CP line parallels the CN line but crosses the City in the downtown area. The third line is owned by the Chesapeake-Ohio Railway (Chessie) and runs in a north-south direction, located just inside the eastern limits of Chatham.

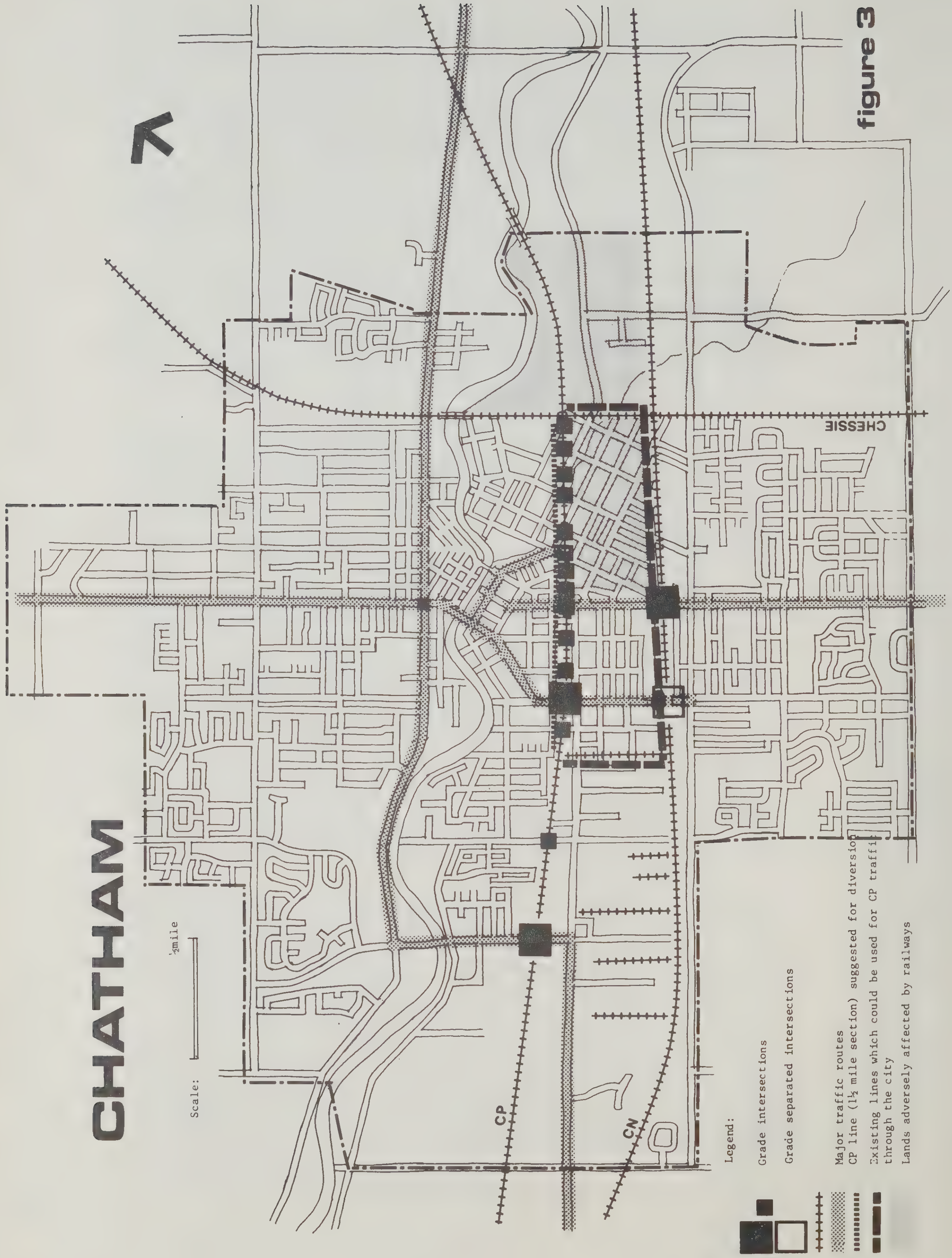
All of the lines are used for freight movement exclusively, except for the CN line on which VIA Rail operates as well. CN and CP lines both serve the industrial area, concentrated in the north-western end of the City. CN provides service to such industries as International Harvester, Dom Tar and Campbell's Soup.

In addition to providing service to its rail dependent industries, the CP line houses the only freight inter-modal facility in Chatham. This truck/rail centre is located in the north-east section of the City near Colborne Street.

The efficient movement of freight through Chatham on both the CN and CP lines is important to both the local economy and the general movement of goods across the province. Some problems have occurred in the City because of the location of these freight lines. The CP line runs through the downtown core and bisects the City. Traffic flow is disrupted due to road/rail conflicts at the many grade crossings, particularly on the CP line. Noise and vibration problems also have a negative impact on the community.

To alleviate these problems and eliminate the perceived duplication of services on the parallel CN and CP lines, Chatham favours a re-routing of CP trains on the CN line. This would eventually lead to complete removal of the CP tracks in the downtown area.

Passenger service is the sole responsibility of VIA Rail and it uses the CN line exclusively. Because Chatham is on the Toronto-Windsor route, the passenger service is fairly frequent - 10 trains per day. The inter-modal passenger facility is the VIA station located at the intersection of the CN tracks and Queen Street. The City would like to see the station become a transportation centre which would combine intercity and municipal bus services as well as connecting with the railway. The intercity bus company (Greyhound) has resisted this idea claiming competition with VIA as the reason. VIA Rail itself has shown little enthusiasm for the proposal.


CHATHAM
figure 3
CHESSIE
CP
CN
Scale:
½mile
Legend:
Grade intersections
Grade separated intersections
Major traffic routes
CP line (1½ mile section) suggested for diversio
Existing lines which could be used for CP traffi
through the city
Lands adversely affected by railways

Data on freight movement for the City of Chatham is limited. Obtaining information about the two Canadian rail companies was difficult. As a result, exact numbers on train movements are not available, but the more heavily used lines have been identified by local officials. The CN line is the most frequently used line in Chatham. It carries more freight traffic than either the Chessie or CP lines and carries all passenger traffic as well.

The CP line carries less freight per day than the CN, but its location, in the core of the City, causes more interruption to the area than does CN.

The only railway company for which data was obtained was the Chesapeake-Ohio. The Chessie has six scheduled freight trains per day that pass through Chatham. Two of these trains run at night. Additional trains are added when necessary.

2.3.2 Existing Land Use

The general land use pattern that developed around the railways has been industrial, particularly in the western section of Chatham. Both CN and CP provide extensive service to the industries in this area. These two lines also run through the centre, the oldest part of Chatham. Industrial land developed adjacent to these lines here as well, but there are considerable areas of residential use particularly along the CP line. The CP divides the City in two and isolates the Central Business District (centred on King Street) between the rail line and the Thames River.

There are no separated grade crossings on the CP line. The numerous grade crossings, particularly in the downtown core, result in traffic slowdown and disruption when trains go through. On the CN line, there is a separated grade at Lacroix Street and a proposal for one at Queen Street. This grade separation will become necessary if the transportation centre is built at this site. It is, at present, the only separated grade priority in the City of Chatham.

The Chesapeake-Ohio line has some abutting industry, but the majority of the land use along the track is residential. This rail line has acted as a barrier to growth and only recently has residential development occurred to the east. Just to the north of the intersection of the Chessie and CP lines is a piece of vacant land that has been isolated by the rail lines. Its waterfront location on the Thames River adds to its potential for development, but its isolation has resulted in its remaining vacant. Lands directly south have also remained isolated.

In general, the growth of Chatham has been dependent on the railways and the resulting adjacent land use has been predominantly industrial. Large areas of residential use, however, have also developed along these lines.

2.3.3 Identification of Problems/Impacts

Since the economic growth of Chatham has depended upon the presence of the railway lines, the benefits that have accrued in terms of an industrial base cannot be discounted. The rail lines have also connected the City with other major centres in Southern Ontario. These positive aspects of the railways' presence are clear.

2.3.3.1 Railway Relocation

The railways' presence in Chatham has created some negative impacts, however. Municipal officials cite as a major problem the fact that both the CN and CP lines parallel each other through the central area and are less than one half mile apart, resulting in what they consider duplication of services.

To overcome this problem the City suggests removal of the CP track in the downtown core.

This would possibly involve re-routing CP trains onto the CN tracks east of Chatham and their subsequent switching back to the CP line just west of the City. The reason the CP line is considered suitable for relocation is that it carries less rail traffic than the CN line and its removal would reduce the problems of traffic congestion due to the many at grade crossings presently on the CP line. Effect on rail-dependent industries in the core would be minimal.

Releasing this land could permit a variety of alternate uses including linear open space or a pedestrian walkway allowing easier access to the CBD. The lands adjacent to the Thames River, presently isolated by the tracks, might then be developed. In addition, residential rehabilitation of bordering neighbourhoods might follow.

While the City is in favour of this relocation of the CP tracks, no background studies have been done to determine its feasibility. With the projected increase of freight and passenger traffic on all rail lines, doubling up rail movement on the CN line (with CP traffic) raises some question of the continued efficiency of both services.

Although the City realizes this could be a long term proposal, it has not yet approached CP. Before serious consideration of the relocation can be taken, communication between the City and the railway is necessary.

The Chesapeake and Ohio rail line has also had an impact on Chatham. It has acted as a barrier to growth in the past and only recently has there been residential development beyond it. The freight movement along this line includes chemicals from Sarnia to the American market and the routing of this line brings it close to Chatham but out of the

way of its destination; the potential dangers of transporting these types of hazardous materials close to an urban area is always present. While it would be more efficient to have a more direct railway route to the American market, the costs of relocating the Chessie line might well be prohibitive.

2.3.3.2 Inter-Modal Facilities

The inter-modal passenger facility proposed near the site of the present VIA station would result in a more efficient and accessible terminal. The "Transpo Centre" would incorporate municipal and intercity buses and include a railway passenger service. The present site of the intercity bus terminal is quite a distance from the train station, in north-east Chatham. With its relocation in a "Transpo Centre" the efficient movement of passengers in Chatham could be easily achieved. The main problem seems to be a lack of enthusiasm for the project on the part of VIA Rail and Greyhound Bus Lines. Competition between the two is the main reason given.

There is presently one truck/rail facility in Chatham in the east end, but the possibility exists for another to be located west of the central area where there is a connection between the CN and CP lines. With the close proximity to major streets (Park Avenue, Richmond Street) a truck/rail inter-modal facility could be constructed.

2.3.3.3 Grade Crossing

The problem of grade separations also exists in Chatham. The Queen Street separation over the CN line is the only priority crossing at present in Chatham. While there are other grade crossings where traffic volume is increasing, no feasibility studies have been prepared. Additional separated grades would provide better traffic circulation and increased safety.

The problem of numerous grade crossings on the CP line would be eliminated by track removal, but other solutions besides separated grades exist even if the track remains. For example, some of the streets might be blocked off at the tracks, forming cul-de-sacs. These could then link with collector roads, thereby reducing the number of roads crossing the tracks.

2.3.3.4 Other Issues

The impact of noise from rail traffic is an issue in some of the residential areas in Chatham along both the CP and CN lines. If the CP traffic were re-routed to the CN line because of relocation, the noise factor on the CN line would increase. This could also become a problem if a residential development occurs along the CN line in the

southwestern part of the city. This potential development, however, depends initially on annexation of the land by the City. Noise barriers may be necessary as is the case for a proposed housing development along the Chesapeake line in south-eastern Chatham.

While the railway lines that run through Chatham have created many impacts on surrounding areas, the main concern relates to the CP line in the downtown core. Before any relocation or rationalization can be considered, more study and communication between the City and the railway companies is needed.

2.4 LEGISLATIVE FRAMEWORK FOR RAIL SYSTEMS

This section briefly reviews the legislative roles of the Federal, Provincial and Municipal Governments regarding railways and surrounding lands. An understanding of this legislation is important in the development of provincial policy for railway rationalization and related land use concerns. A separate paper, Legislation and Jurisdiction (Ministry of Transportation and Communications) has been prepared for the Task Force and provides greater detail.

2.4.1 Federal Government

Three Federal Acts provide the legislative framework for railway regulation in Canada. These are: The Railway Act (1907); The National Transporation Act (1967); and, The Railway Relocation and Crossing Act (1974).

Although these Acts address a wide array of railway concerns, only those parts of the Acts that deal closely with railway-land use concerns were reviewed for this paper. Specifically these areas are:

1. Railway Abandonment;
2. Railway Relocation;
3. Railway Grade Separation.

2.4.1.1 The National Transportation Act

The National Transporation Act defines and implements a national transportation policy and sets standards and criteria for railway rationalization. This may include:

a) the rights of railways to increase, reduce or abandon existing railway services;

b) the subsidization of railways for uneconomic passenger services and branch lines which railways are required to operate in the public interest.

The Act also sets out the powers and functions of the Canadian Transport Commission (C.T.C.), as the federal regulatory agency.

The C.T.C. is involved in economic regulation, the granting of licences and rights to national and international transportation services. It has the authority to administer the provisions of The Railway Act and The Railway Relocation and Crossing Act.

2.4.1.2 The Railway Act

The Railway Act sets out the procedure to be followed by the C.T.C. to hear applications for railway abandonment (Sections 252-261, "Railway Abandonment and Rationalization of Lines or Operations"). An action to seek an abandonment of a railway line is undertaken at the initiative of the railway company. In determining whether a branch freight line should be abandoned, the Commission considers:

- the losses incurred in the operation of the line;
- alternative transportation facilities;
- the period of time needed to adjust the lines so as not to disrupt the local economy of the area;
- the effects of abandonment on other lines;
- the economic effects on communities;
- the feasibility of maintaining the line;
- joint sharing of lines;
- existing or potential resources serviced in the area.

With regard to passenger service, the Commission considers:

- the losses incurred in the operation of the line;
- alternative passenger services;
- effects on other transport carriers;
- future transport needs of the area.*

Although it does address a number of economic issues, the Commission is not formally empowered to consider land use issues (conflicts) as a reason for rail line abandonment.

Following the Commission's approval to abandon a branch line, the railway company may dispose of the land or maintain it for railway purposes. If the railway decides to sell the land, it is usually offered for sale to the Province, the Municipality, or adjacent land owners. There is no regulation regarding the use of the land under the Act.

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* (Railway Act, 5.254, p.3; 5.260, p. 6)

2.4.1.3 The Railway Relocation and Crossings Act

This Act specifically addresses two issues. The first is railway relocation; the second is railway grade separation.

Railway Relocation

Railway Relocation is dealt with under Part I of the Act, entitled "Joint Urban Development and Transportation Plans" (sections 3 to 14). The objective of railway relocation under the Act is to improve the safety of railways in urban areas. Relocation also allows for alternative future use of railway lands (e.g. commercial uses, open space, etc.).

Under the Act, a railway relocation project begins with a municipal/provincial initiative. Following an agreement by these two levels of government that railway relocation is appropriate, a submission is prepared to be evaluated by the C.T.C. This submission must consist of three planning documents:

1) an urban development plan;
2) a transportation plan;
3) a financial plan.

The urban development plan should indicate the proposed development of the urban area, expected improvements, an assessment of social and environmental impact, a method of implementation and staging and financing.

The transportation plan should describe the relocation and re-routing scheme and implications for other transportation systems, and should set out an implementation program showing staging and financing.

The financial plan should summarize costs, cost sharing and the amount of grant to be requested.

Once the Municipality and the Province have agreed upon an urban development plan and a transportation plan, it becomes the accepted plan for purposes of this part of the Act.

The plan is then submitted to the C.T.C. A hearing is held on the plan, and, if approved, the transportation plan comes into effect. It is up to the Municipality(ies) and the Province, then, to come to a formal agreement to seek relocation. Once an agreement is reached and the plans approved by the C.T.C., a relocation grant may be paid by the Ministry of Transport (not to exceed 50% of the net cost).

Following approval of the Act, Ontario was approached by twenty-one municipalities for relocation study funding. Of

the twenty-one, five communities were selected by the Province, based on:

- problems created by existing rail lines;
- status of existing plans
- development opportunities after relocation;
- effects on municipal-provincial finances;
- feasibility of relocation;
- general estimate of costs;
- municipal commitment to relocation.

The five communities chosen were Brantford, Niagara Falls, North Bay, Sudbury and St. Thomas (St. Thomas later withdrew its application).

Although funding was made available for feasibility study purposes, neither the Province nor the Federal government committed themselves to funding for implementation of relocation plans. At the time of writing, the North Bay study is completed, while the other three communities have still to complete their studies. North Bay has no assurance that implementation funding will be available for relocation.

Railway Grade Separations

Part II of the Act provides funds for construction or reconstruction of grade separations. In this case, application for assistance is made to the Commission by the province or by any municipality on behalf of the Province. In carrying out an inquiry for the application, the C.T.C. requires the submission of land use plans and transportation plans relevant to the proposed construction or reconstruction of the grade separation.

The Commission, before approval of funding, must receive evidence from the applicant that the government of the province and all municipalities concerned have approved the transportation plans. Once the plans are approved by the Commission, it may make a grant in respect of the project, providing up to 50% of the costs.

In determining which projects will proceed, municipalities and the Province have developed grade separation priority lists. These lists may change as safety and convenience issues arise at different grades.

2.4.1.4 Urban Transportation Assistance Program (U.T.A.P.)

The Federal Government introduced major funding changes in 1977. These changes essentially reduced the level of Federal Government support available under The Railway Relocation and Crossing Act. A total of $16.5 million per year for each of five years (1977-82) would be made available to Ontario.

This ceiling on federal funding under the Act, has reduced the opportunity for railway relocation studies and implementation in Ontario. To date, Ontario has allocated all the available U.T.A.P. funds to its grade separation programme and must be distributed to projects among the provincial grade separation priority list. In an era of restraint it is unlikely that the Province will be in a position to assign additional funds to the program.

2.4.2 Provincial - Municipal Legislative Framework - The Planning Act

Introduction

The regulation of railways is not part of the provincial legislative framework. However, through the Planning Act, the Province provides controls for the use of land around railways, and land upon which railways operate.

Under the Planning Act, the Official Plan is used to develop land use policies and programmes at the municipal level. When the Official Plan is implemented by a zoning by-law, the use of lands is restricted to various functions (e.g. residential, commercial, industrial). Rail lines may be zoned, as specific uses, or may fall within surrounding land use designations (e.g. residential). A major question with respect to railways is under what circumstances they must comply with local plans. This concern must be clarified on an issue by issue basis, since railways are exempt from lower level plans when they are acting in the national interest to provide rail service. At other times, railways are seen in the same light as any other corporation, and must conform to local plans.

Under section 33 of The Planning Act, the Province has the power of approval for the subdivision of land. As part of the draft plan process, applicants are required to submit plans showing the nature of existing uses of adjoining land, and natural and artifical features such as buildings, railways, highways, etc.

Generally, the Province makes comments on proposed subdivisions near rail lines. There are, however, no provincial standards for distance separation between buildings and lines, either for noise or safety reasons. Proximity to rail lines is therefore a limited reason alone to refuse approval.

Recently the railroad companies have expressed concern over residential development near their lines. To protect their interests they are seeking deed registrations warning prospective home buyers of the railway operation in proximity to the property.

Under section 35(a), the Province and Municipalities can impose site restrictions on development. Section 35(a), s.6, p.a(6), provides that as part of a site plan agreement municipalities can require the landowner to provide: "Walls, fences, hedges, trees, shrubs or other ground cover or facilities for the landscaping of the lands or the protection of adjoining lands."

This provision of the Act has been recently used by the railways to protect their interests when new developments are proposed adjacent to their lands. However, it is sometimes unclear as to when railways are subject to these provisions.

2.4.3 Proposed Revisions to The Planning Act

Neither the White Paper on The Planning Act nor The Draft Planning Act made special mention of railways or rail lines. A number of provisions in the revised Act may, however, affect the Provincial role in railway rationalization.

2.4.3.1 White Paper on the Planning Act

The White Paper on The Planning Act sets out a number of principles that were incorporated into the new draft legislation. Those of interest to this study are:

- greater accountability within the local planning system, with the Province retaining province-wide consistency through the approvals process;

- greater use of provincial guidelines and policy circulars to clarify provincial policies;

- planning is an exercise of balancing private and community rights; therefore the responsibility must be shared between private and public interests;

- the need for public involvement in the planning process.

In following these (and other) principles, provincial ministries and agencies would take local planning policies into account when developing their policies. Local municipalities would have more responsibility over planning matters, but the Minister of Housing may designate a matter to be of provincial significance. These principles may encourage new opportunities favourable to railway rationalization in defined planning areas.

2.4.3.2 Draft Planning Act

The Draft Planning Act generally defines the nature of provincial interest, provides for the issuing of provincial

policy statements, requires consultation on public works, and generally outlines the matters to be addressed in Official Plans.

Rail-related areas of provincial interest, then, include:

- the efficiency and amenity of communities;
- the provision of major communication, servicing and transportation facilities; and,
- the co-ordination of planning activities of municipalities and other public bodies (and the resolution of planning conflicts).

In issuing provincial policy statements under the Draft Planning Act, the Minister would be able to identify municipal planning matters that are of provincial interest. All government agencies, including Ontario Hydro, would have regard to such statements (Part I, Section 3).

Section 6 of Part I would require Ministries and their agencies (including Ontario Hydro) to consult with any municipality that may be affected by a provincial undertaking. The established planning policies for the municipality would have to be taken into account before carrying out the undertaking.

Section 7 would permit the Minister to make grants of money to any municipality to assist it in any duty or function of a planning nature. A wide range of general matters could be addressed in Official Plans (Part II, Section 16).

2.4.3.3 Conclusion

The Draft Planning Act would provide for greater local autonomy and responsibility in local planning matters, with the Province retaining Official Plan approval powers and assuming a planning co-ordination-conflict resolution role among municipalities.

Where a municipality(ies) identifies railway rationalization as a planning priority, the Official Plan could become a powerful tool to this end. Where plans contain long term rail rationalization concepts for their communities, the interest of the railways, the Federal Government and the Province could be focussed in support of municipal action.

Since railways are corridor land uses conceptually similar to Ontario Hydro, there may even eventually be some basis for Ontario to require railways (as a sort of public utility) to have regard to local plans.

The Province could be in a better position to encourage local initiative along these lines following the adoption of the new Planning Act.

2.5 SUMMARY OF PROBLEMS AND ISSUES

The preceeding sections have identified a number of problems and issues related to rail lines in urban areas. There are two main types of problems identified: those associated with the physical presence of the rail line and its use; and those concerned with administration or policy and planning matters. The types of problems are outlined below.

Problems Associated with Rail Lines and Their Use

1. Community Barriers

- restrictions to community development;
- sectionalization of parts of the community;
- isolation of pockets of land;
- shaping of planning areas (e.g. waterfront);
- presentation of psychological barrier - perceived limited access.

2. Hazards

- train-auto/train-pedestrian accident potential;
- movement of hazardous materials by rail;
- storage of hazardous materials near rail lines;
- derailments;
- restrictions on free movement of emergency vehicles.

3. Environmental Problems

- noise;
- vibration;
- air pollution (from trains and waiting automobiles);
- visual unsightliness.

4. Land Use Conflicts

- main concern in residential and core areas;
- rail/roadway;
- underutilized or abandoned rail lands in developed areas.

5. Inefficiency

- traffic congestion and its costs in terms of energy and time lost;
- trains slow during runs through urban areas (energy, time loss);
- maintenance of grade crossings, signals, track, etc.;
- old and/or out of date facilities in core areas (where land values are relatively high);
- increased theft/vandalism of railway property;
- duplication of rail service;
- lack of inter-modal facilities.

2.24

Problems Related to Administration of Policy and Planning

1. The problems of each municipality are specific to the historical development of the community. This makes the costs and benefits of rationalization highly variable from place to place.

2. There appears to be a need for clear performance standards for various land uses. Those identified were for noise/vibration, noise-proofing and set-back separation distance from rail lines. Standards could be applied to both existing and future development. Both railway companies and the public wish to be protected from land use incompatibilities and hazards.

3. Cost sharing among the various actors engaged in railway rationalization in urban areas. Railways do not wish to lose income, efficiency, control over their own rail traffic or to bear total rationalization costs and/or increased line maintenance costs; municipalities may be unable or unwilling to assist in paying for potential operating losses.

4. Competition among railways (related to No. 3, above). This may even affect inter-modal facilities planning.

5. Intergovernmental co-ordination and co-operation on rail line rationalization in urban areas (Municipal, Provincial, Federal, railway companies).

6. Apparent remoteness of railway companies' "head offices" in relation to the communities they serve, and the municipal planning process in general. A need for greater communication among all the actors was identified.

7. Amount and degree of funding for the various steps necessary as part of a railway rationalization process (related to No. 3, above). These steps would include, but may not be limited to:

   - establishment of a province-wide priority list of municipalities in which railway rationalization may be feasible;
   - area-specific feasibility studies for each municipality to determine the costs and benefits of rationalization;
   - establishment of a rationalization plan, as part of the municipality's overall planning framework (including an implementation program).

8. More rigorous application of existing land use controls to prevent future land use conflicts with rail lines. This could be extended to existing built-up

areas where a municipality opts primarily for a long term planning solution to railway rationalization.

9. The amount of "red tape" now required for certain rationalization elements (e.g. relocation and removal of grade crossings).

Where clear or fairly clear issues can be identified, opportunities for corrective measures and an improved rationalization process can be identified. Consideration of some of these opportunities are discussed in the next section.

That section and the one following (Provincial Policy Directions), also serve as a set of self-contained "Conclusions" for this Study.

3. RAILWAY RATIONALIZATION AND REVITALIZATION

The preceeding sections have identified major problems associated with Ontario rail lines in urban areas, using a case study approach. This section identifies some possible opportunities for rail rationalization, and related revitalization techniques. We developed these conclusions using the results of our three case study examinations.

3.1 OPPORTUNITIES FOR RAILWAY RATIONALIZATION AND URBAN DEVELOPMENT

Simply stated, railway rationalization means the restructuring of the rail system to achieve the greatest degree of efficiency and acceptability that is feasible for an area. When all the actors involved in a railway rationalization process agree on a common approach, then implementation of a rationalization plan may proceed successfully. The participants most directly affected by railway rationalization are the railway and the local municipalities.

3.1.1 The Railway Perspective

Railway companies, functioning on the profit motive, have been involved in rationalizing their systems in urban areas for some time (CN freight yards, Maple; CP Scarborough yards). When identifying rationalization opportunities from the railways' perspective, the economic efficiency of the system must be considered a priority.

In general, railways would like to eliminate as many of the inefficiencies in their systems as possible. These may include:

- duplication of service among railway companies
- high maintenance cost (e.g. grade crossings, tracks, etc.);
- reduction of speed necessitated by urban areas
- underutilized lines;
- outmoded facilities (especially in core areas);
- theft and vandalism (prevalent in urban areas).

Railroads are also concerned with hazards associated with their operations including rail-auto-pedestrian accidents and hazardous materials. Recently railroad companies have expressed concern over new land uses coming into conflict with their lines, and have suggested that alerts regarding nearby lines be registered on title of new properties, especially in residential areas.

In eliminating these problems, railroads wish to retain:

- the cost effectiveness of their service;
- the customers they serve, and the efficient parts of their system.

These factors all must be weighed as part of the overall costs of railway rationalization.

3.1.2 The Municipal Perspective

A goal of municipal planning is to balance a wide range of community needs and expectations in order to provide a safe, efficient, and pleasant living environment for people. With respect to railway lands (only one of an array of planning concerns), municipalities would generally like to eliminate:

- railway-related hazards to the community;
- environmental problems such as noise, vibration and pollution;
- land use conflicts associated with rail lines;
- the barriers to community development presented by rail lines;
- inefficiencies in road and other transportation facilities (including inter-modal links) related to the presence of rail lines.

In doing so, municipalities would like to retain those transportation functions of the railroads that help sustain the economic vitality of the community. This applies to both freight and passenger rail functions.

Some municipalities tend to think of the railway companies as remote and generally not subject to local controls. (In areas where the railroads act in the national interest to provide rail service, this is the case.) There are situations where the railroad companies must comply with local plans, but this must be determined on a case by case basis. A clearer definition of railway land roles and responsibilities is required.

Perhaps because of this, railway lines do not receive consistent treatment in municipal plans. Sometimes rail lines are designated as rail corridor uses; in other cases they take on the surrounding land use designations, as do roadways (e.g. residential, industrial). The identification of rail lines and associated lands as specific transportation uses could make a positive contribution to the rationalization process.

3.1.3 Summary

Railway companies and municipalities appear to have a number of overlapping common interests. These interests are the clearest in the areas of land use conflict avoidance and the elimination of rail-related hazards. Railway rationalization efforts should be directed at these main concerns. In doing so many of the associated problems of community barriers, environmental problems and inefficiency can also be addressed.

The costs of rationalization must be clearly defined in the process and fairly allocated in proportion to the resultant benefits each participant will enjoy, and within financial restraints. Although railway companies try to provide the most efficient service possible, further improvement may be feasible in some municipalities where railway rationalization is seen as a major priority.

The next section reviews some possible alternative uses that could be pursued for railway lands that may no longer be required by railway companies as a result of railway rationalization.

3.2 OPPORTUNITIES FOR REVITALIZATION

Underutilized land, and/or railway lands abandoned for rail service as a result of rationalization, can be put to a wide range of alternate uses. This section explores some of these opportunities.

3.2.1 Types of Lands with Revitalization Potential

Existing railway lands can offer a great variety of opportunities for revitalization if taken out of rail service.

Four functional types of railway lands may have such a potential:

- main lines;
- spurs;
- yards;
- other lands owned by railway and used for other than the above uses or vacant.

These lands could include administrative buildings, terminals, or various installations.

In terms of how the land is being used, all the above might fall into the following categories:

1. Abandoned (or vacant) lands with no tracks, installations or buildings. These would usually be land holdings or abandoned spurs where tracks or yards have been removed.

2. Abandoned lands with tracks or buildings still there but not being used. (A railway station on a line that is not used for passenger traffic is a typical case. Many stations are architecturally attractive, structurally sound and well located. They have been abandoned and may have become run down, but have good potential for rehabilitation and conversion to other uses.).

3. Lands with rarely used lines. There are lines and spurs that were used extensively in the past, but as the needs changed and diminished they were not used as frequently as before. Some industries switched to trucks; others moved or ceased to exist, leaving many rail facilities not used to their full potential.

   In some cases there is a possibility of diverting such traffic to other existing lines or spurs in the area. This may not create much disruption and could free land for other use. In extreme cases where existing lines for the diversion of traffic are not available, a new overpass line may be necessary.

4. Land oversized for specific use. Some railway yards take a great amount of land which is not really required for the operation. A portion of such lands may be put into other uses.

5. Lands not owned by a railway but physically isolated by railway lines or yards. This type of land can have a great potential for development and active use following railway line removal and/or access provided to the site.

3.2.2 Possible Uses for Railway Lands

Lands freed from railway use offer a great variety of opportunities for reuse and revitalization. Abandoned lines running through the city may become transportation corridors for light rapid transit, streetcars and buses. Alternatively, exclusive rights-of-way may be provided for fast public transportation between the core and the suburbs. New arterial roads might be built in cases where traffic is a problem.

When high volume transportation is not required such a long strip of land, usually 50', 66' or 100' wide, may be used as open space, with walkways and/or bicycle paths linking other parks or essential areas of the city.

When the railway line or spur is rarely used and there is no feasible possibility for diversion, a dual land use may prove to be a good solution. The land might stay under railway ownership and be leased by the municipality or it could be purchased by the municipality with the provision for an easement for railway use. A number of other legal-ownership arrangements may also be possible.

A typical example of this approach might be a long spur, rarely used, managed by the municipality, landscaped as a public open space with a walkway and a bicycle path, with the railway tracks left in place, paved and used by the railway infrequently (with special safety precautions).

3.5

Any conversion of railway lands into open space with an accompanying reorganization of traffic and surrounding space may have a considerable impact on surrounding areas, especially in residential neighbourhoods or in core areas where the intensity of public use is higher.

The reduction of problem grade intersections, railroad noise levels, traffic congestion, aesthetically obstructive installations and tracks and the removal of physical barriers may drastically change the surrounding areas and encourage their revitalization.

The areas around the rail line may be reorganized once the tracks are removed allowing for better organization of traffic, better use of previously disrupted city blocks (as we noted is a possibility in Chatham) and the opening of a variety of new land use opportunities.

The negative impact of rail lines on surrounding neighbourhoods can be diminished in a variety of ways. A part of the railway right-of-way can be used for landscaping (landscaped berms, hedges or fences to reduce the noise level might also improve the appearance). This can be done by the municipality by simply purchasing or leasing a narrow strip (5'-20') of railway land.

In many instances when railway lines cut across the core area, disrupting city fabric, improvements can be done around railway land. Traffic can be organized in a better manner by the provision of a collector road, cul-de-sacs and the reduction of the number of intersections with railways.

Some cities have had their waterfronts isolated by railways. Removal or diversion of those lines could open better public access to a lake or river and offer excellent opportunities for new parks, public spaces, marinas, sport facilities, exhibitions, tourist accommodation, etc. Some railway holdings (example: Niagara Falls) have a great potential for the development of facilities to serve tourism.

Abandoned, or parts of oversized, railway yards or other railway holdings can be turned into open space, sport facilities, housing developments, institutional, industrial or commercial uses. Lands can be purchased by the municipality and/or private developers or railway companies can participate in those new ventures.

Provision of an inter-modal facilitiy is another opportunity for railway land use. Existing railway terminals often have sufficient amount of land around them to accommodate a bus terminal and a rental car service. Such an effort is being made in Chatham where the City is encouraging an intercity bus company to relocate to the site next to the railway terminal.

3.2.3 Summary

This section has identified a number of possible alternative uses for abandoned or underutilized railway lands. There may be other types of uses possible. Each municipality must identify the positive aspects of such lands in their community. A creative approach to the reuse and revitalization of these areas could enhance the existing function and character of many of our urban areas.

3.3 THE PROVINCIAL ROLE

The Province of Ontario could have a significant role in encouraging both the rationalization and revitalization of railway lands in municipalities. Sections 3.1 and 3.2 have identified a number of opportunities for both rationalization and revitalization based on the problems and issues that we identified in Section 2. Three main areas for Provincial involvement emerge from this study:

- communication;
- planning; and
- administrative.

3.3.1 Communication

The need for improved communication between the providers of rail service and the communities that are served by their systems was apparent throughout the study. Except for meetings made in fulfillment of legislative requirements under The Grade Separations and Crossing Act and U.T.A.P, the municipalities that we contacted tended to view railway companies and federal agencies as separate and remote from day to day planning.

The Province could serve an important function by bridging this perceived gap where rationalization and revitalization is a municipal priority. Where municipalities wish to pursue rationalization, the Province could facilitate contact among railway companies and Federal Departments and the municipalities as well as aiding in finding mutually acceptable approaches to common problems. In some cases, it may even be appropriate for the Province to act as spokesman on behalf of municipalities, particularly where provincial interest has been defined.

Improved communication links are critical to the successful pursuit of other possible Provincial roles.

3.3.2 Planning

The Province has both a responsibility and an opportunity to provide policy guidance on matters related to railway rationalization.

Some of these matters include the development of noise and vibration performance standards and policies for the transport of hazardous materials within the Province.

Sensitive application of land use planning controls near rail lines could be encouraged and co-ordinated among municipalities, and more rigorous evaluation of development proposals under existing legislation could be instituted with respect to railway lands. Where a number of municipalities are engaged in a rationalization program, provincial co-ordination and conflict resolution at the local level could improve the chances of successful planning and implementation.

Co-operative planning involving the three levels of government should be enhanced through Provincial involvement in the process.

Finally, where implementation of a rationalization program is to proceed, or where the planning process itself may take an extended period of time, the Province is well suited to a monitoring role. This would ensure that changes in the "state-of-the-art" of railway rationalization planning are incorporated into ongoing programs, and that the impetus for the implementation of programs is sustained over time.

3.3.3 Administration

The establishment of funding priorities and implementation strategies is a central element of railway rationalization. Within the Provincial sphere, the Province may be the best judge of which municipalities might benefit most from detailed feasibility studies for rationalization.

A Provincial priority list of municipalities in which rationalization may prove feasible could be prepared, and such communities could be party to more detailed feasibility studies. Establishing feasibility is only the first step to rationalization, and should be directly linked to a clear implementation strategy, as outlined in a comprehensive rationalization plan. Both the feasibility study stage and the implementation stage should be linked as part of a rationalization program.

Funding for a railway rationalization program is a critical element, especially in an age of spending contraints. Commitment of resources from the three levels of government would be an essential part of such a program. Simplification of the process should be considered to lead to disentanglement and increased efficiency between the Federal and

Provincial levels. A general funding strategy should be considered at the outset of a program, if selective rationalization is to proceed. In this way, the Province would be in a position to simplify the transfer of funding for local studies and implementation.

Within this general framework for a Provincial role in railway rationalization, the next section suggests possible policy directions for Provincial action.

4. PROVINCIAL POLICY DIRECTIONS

The preceeding sections have demonstrated the need for a Provincial role in railway rationalization in urban areas. This section suggests a number of areas for the development of Provincial policy.

Policy should provide for the most efficient implementation of railway rationalization possible and result in solutions satisfactory to those actors involved in the process. A major role that the Province could contribute is to help formulate and formalize the overall process leading to rationalization. The current planning requirements under the federal Railway Relocation and Crossing Act appear sound but should be linked more clearly with the Ontario land-use planning framework. By doing so, improved communication and (hopefully) improved co-operation between the municipalities would result.

The Province could contribute, in the first instance, by identifying those communities that would benefit from railway rationalization, and in which it may be, at first glance, feasible. These could then be priorized.

Through negotiation with the Federal Government, a cost sharing approach for rationalization could be established. An integral part of such an approach could be significant municipal and railway involvement, since the municipalities and railways would receive most of the benefits of rationalization.

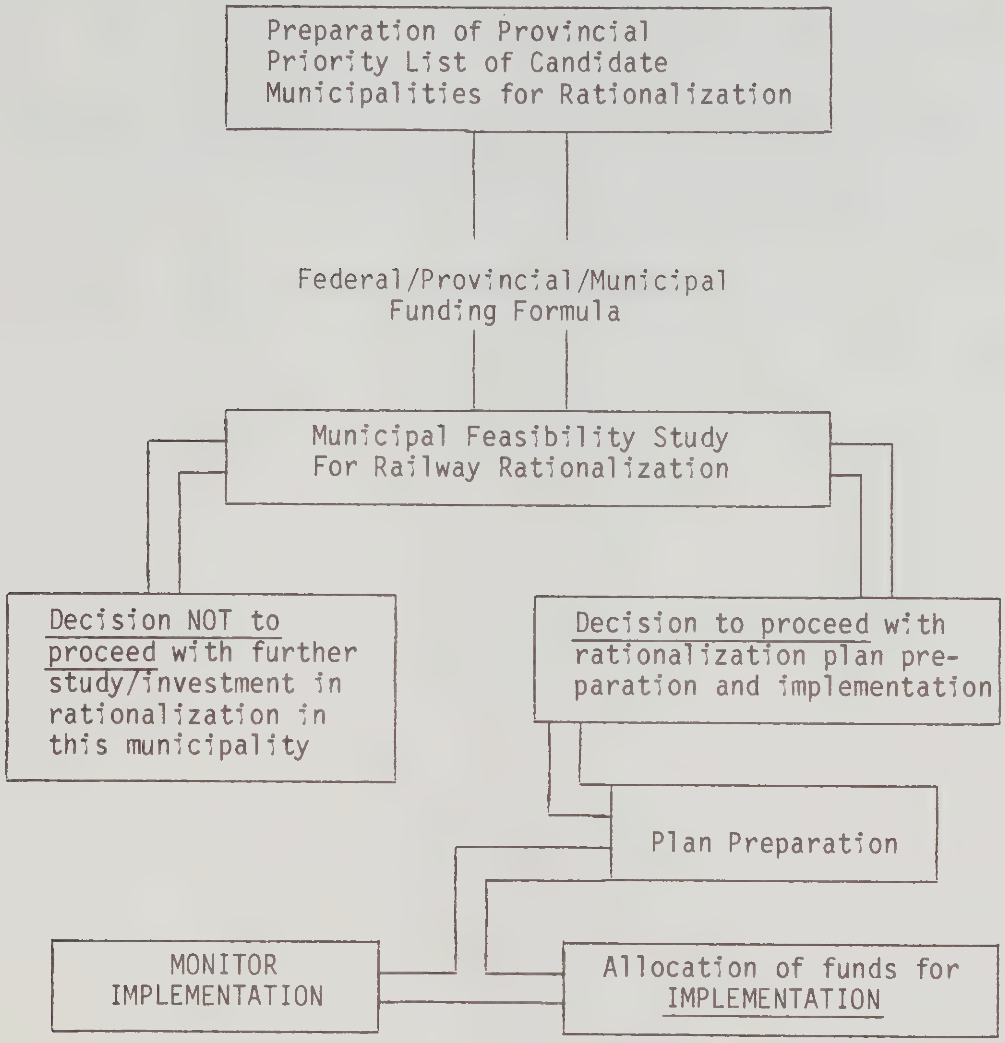
Within the funding structure, resources should be set aside to provide for reasonably detailed feasibility studies for rail line rationalization. This would determine whether more elaborate planning and implementation studies should be pursued leading to a final rationalization plan (possibly to form part of the Official Plan) for the community.

Many details would form part of these studies and many of the issues to be considered have been outlined in this paper. The specifics of local studies should be designed for each community. Greatly simplified, the policy direction envisioned would be as follows:

4.2

FIGURE 4

RAILWAY RATIONALIZATION - PROPOSED PLANNING PROCESS



The establishment of a formal process for railway rationalization would provide a structure within which more specific provincial policy could be implemented. Policy areas for provincial involvement that have been identified in this paper include policies on:

- noise and vibration associated with railways:
- the transporting of hazardous materials by rail through urban areas. Storage of such materials in proximity to rail lines;
- avoidance of the development of conflicting land uses near rail lines;
- Federal/Provincial/Municipal funding structure;
- provision of appropriate inter-modal facilities.

4.3

Where it is not feasible to prepare comprehensive railway rationalization plans in a community, a long range planning approach to alleviate some problems may still be taken. This could ultimately lead to the reduction of rail-associated problems in a municipality, and could provide a framework within which some (or all) specific provincial policies could be implemented.

Senior governments and their agencies should be consulted on such local planning strategies, particularly with regard to their interests. Following completion and approval of such plans, senior agencies should have regard to local planning policies.

This general discussion of Provincial policy direction leads to the final section on areas for further study.

5. FURTHER STUDY

In order to move in the suggested direction for Provincial policy, a number of areas will need to be the subject of specific work.

Most pressing would be the establishment of a funding formula for rationalization (the actual definition of which would have to be flexible) among the Federal, Provincial and Municipal levels of government. This formula would view rationalization as a necessary and specific activity within the existing planning context for urban areas in Ontario. (In designated areas it could replace the requirements of the Federal Railway Relocation and Crossing Act, for example.)

When railway rationalization is established as a viable approach to alleviating problems in some urban areas (or simultaneous with such deliberations), the establishment of a priority list of candidate municipalities should be undertaken. The preparation of this list should consider:

- the degree of conflict/impact to which the municipality is subjected;
- the ability and willingness of the municipality to allocate resources to railway rationalization;
- the probability that rationalization will be feasible, following detailed study.

Other areas for further study would include:

- containerization of hazardous materials;
- noise attenuation techniques/strategies;
- multiple use of underutilized lines;
- applicability of existing government programmes to rationalization and revitalization (e.g. Downtown Revitalization, Main Street, etc.).
- economic and financial impacts of railway rationalization;
- community/urban design impacts and potential of various approaches to rationalization;
- innovative, but practical, approaches to railway rationalization.

General analytical work in these and other subject areas should precede the development of policies and/or programs for railway rationalization in Ontario.

TRANSPORT

An Overview of Rail Passenger Usage
in Ontario

Prepared for the
Ontario Provincial Rail Policy Task Force

U.R.T.P.O.
May 28, 1980

Rail Passenger Usage in Ontario

EXHIBITS

5. Operating Characteristics in Selected Corridors

6. Suburban Commuter Rail Operating

An Overview of Rail Passenger Usage in Ontario

1. Introduction

This overview has been compiled at the request of the Provincial Rail Policy Task Force. It is intended to provide background material on rail passenger usage in Ontario for various studies by the Task Force.

The data has been obtained from a variety of public sources including the Canadian Transport Commission, Transport Canada and Statistics Canada. For rail passenger usage there is no single agency charged with the responsibility for collecting, collating and distributing information. The Canadian Transport Commission along with the railways would appear to have the largest data base, but unfortunately much of this data is confidential.

As a result, much of the data comes from limited samples collected for individual projects or issues. In many instances, this has resulted in inconsistent information several examples of which will be highlighted in the following sections.

The reliability of passenger ridership information should improve in the future with the introduction of VIA's new computer based reservation system. But at present the access to this new information source by the public and government agencies such as M.T.C. is not certain.

This overview presents in Chapter 2 a broad comparison of freight and passenger rail usage. This provides a context in which the passenger services may be viewed.

Chapter 3 outlines the current rail passenger services provided in Ontario and some indicators of rail usage by community.

Questions about who is using passenger services are answered in part in Chapter 4, by an examination of user characteristics in the principal rail corridors.

The financial, equipment and service characteristics are reviewed in Chapter 5.

The provincially sponsored commuter rail system has been examined in Chapter 6. This chapter has been previously submitted to the Task Force under a separate memorandum.

2. Perspective On Rail Passenger Usage

Rail passenger operations are a very small portion of the total railway operations in Canada. Exhibit 2-1 provides some key measures for passenger and freight usage in Canada. The exhibit shows the following:

- The average trip length for freight is twice the corresponding passenger value.
- The freight system has twice the route mileage of the passenger system.
- The freight system generates 4 times the train miles of passenger system.
- The freight system has 30 times the passenger gross ton mileage.
- The freight system generates 20 times the revenue of passenger services.

Comparable data for Ontario exclusively was not available, except were indicated, from public sources such as Statistics Canada.

Exhibit 2-2 also emphasis the relative roles of freight and passenger services with respect to revenues. Over 80% of the railway revenues are attributed to the moving of freight.

Exhibit 2-3 (for passengers) and Exhibit 2-4 (for freight) indicate the change in demand from 1960 to 1977. For passengers, the historical pattern is somewhat erratic, but the current level is below the 1960 level of usage. On the other hand the railway revenue tonne-km has steadily increased. This implies that in relative terms, rail passenger traffic has been a declining share of the total rail traffic in Canada. This long term trend does assist in explaining the rail operators' desires to concentrate on freight services.

EXHIBIT 2-1

1977 Indicators of Rail Usage

PASSENGERS	CANADA	ONTARIO
Carried	23 862 260	
Miles (Millions)	1 828	
Route Miles[1]	20 860	4 950
Train Miles (Millions)	18.3	
Train Gross Ton Miles (Millions)	8 872	
Fuel (Millions of Gallons)	48.175	
Revenue (Millions $)	137	
Trip Length Average Non Commuter	283	
FREIGHT		
Revenue Tons (Millions)	272.5	
Ton Miles (Millions)	145 493	
Route Miles[2]	42 184	9 756
Train Miles (Millions)	68.3	
Train Gross Ton Miles (Millions)	282 114	
Fuel (Diesel Oil in Million Gallons)[3]		
Total	490.583	160.852
Freight	412.206	
Yards	35.936	
Revenue (Millions $)	2 953	
Average Miles Hauled	534	

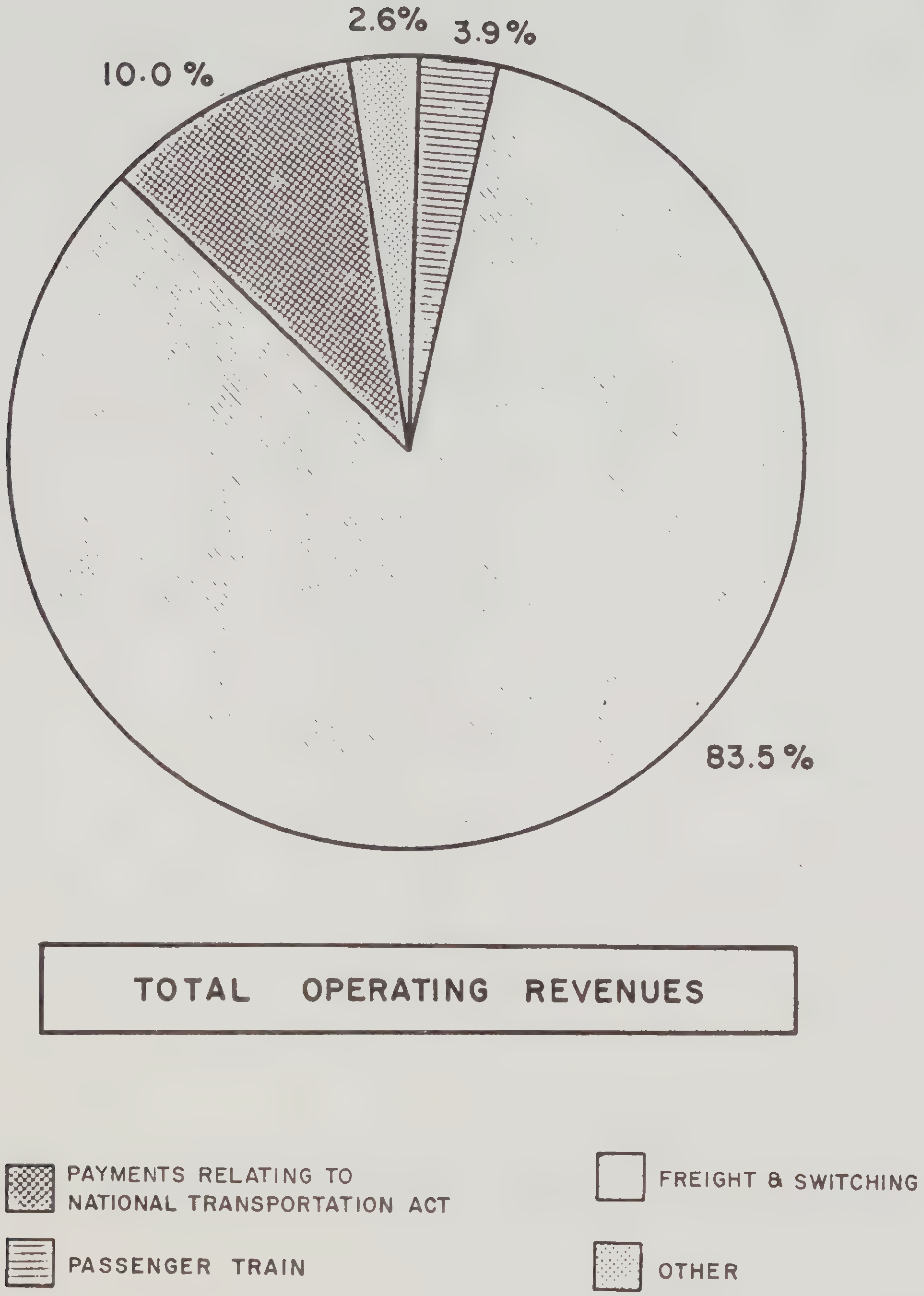
1) Lukaseiwicz, Passenger Rail in Canada: Opportunities for Rationalization and Modernization

2) Excludes industrial, yard and siding tracks, S.C. 52-209 Table 8

3) S.C. 52-209, Total for all rail services (freight, passenger and yard operations)

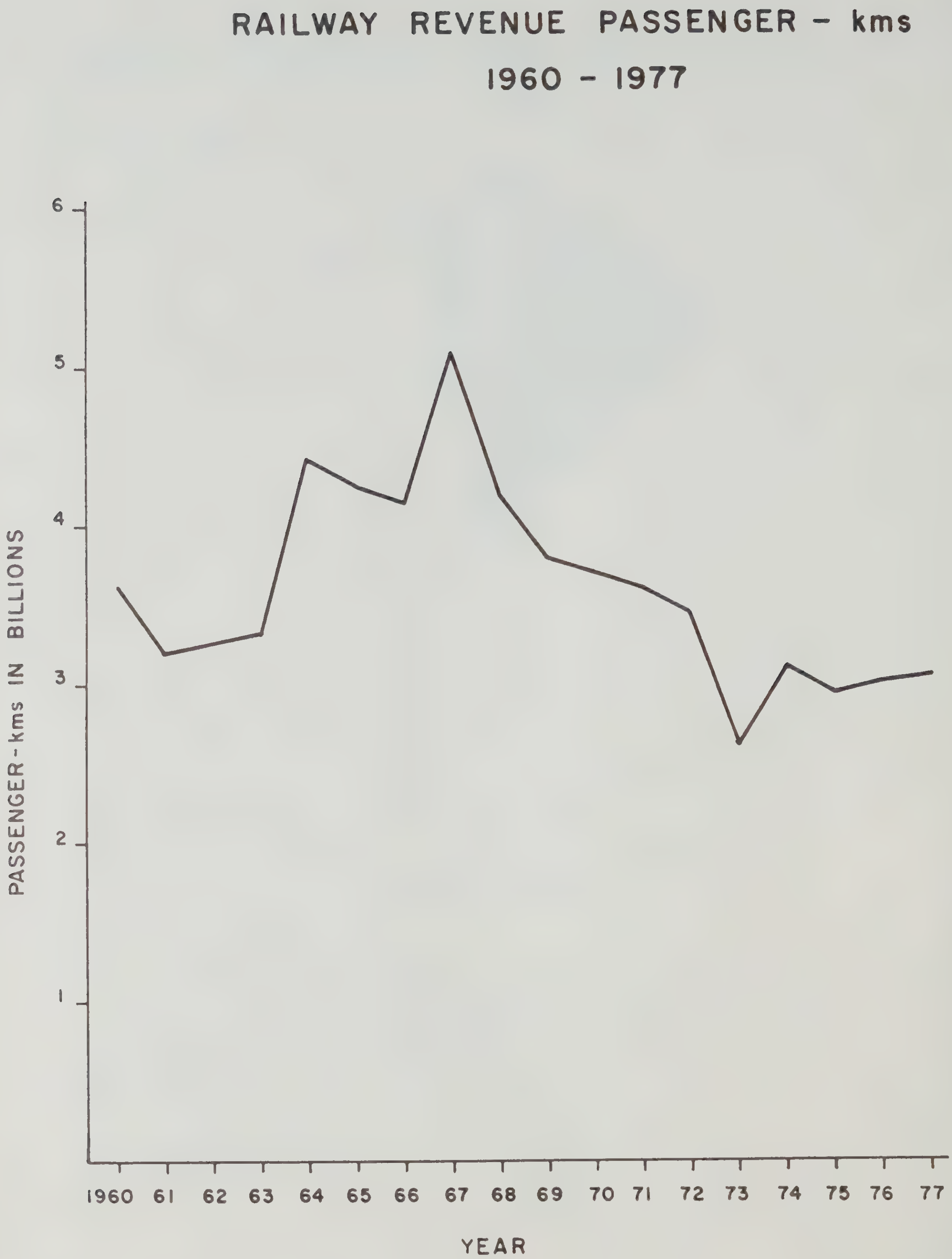
EXHIBIT 2-2

RAILWAY OPERATING REVENUES: 1977



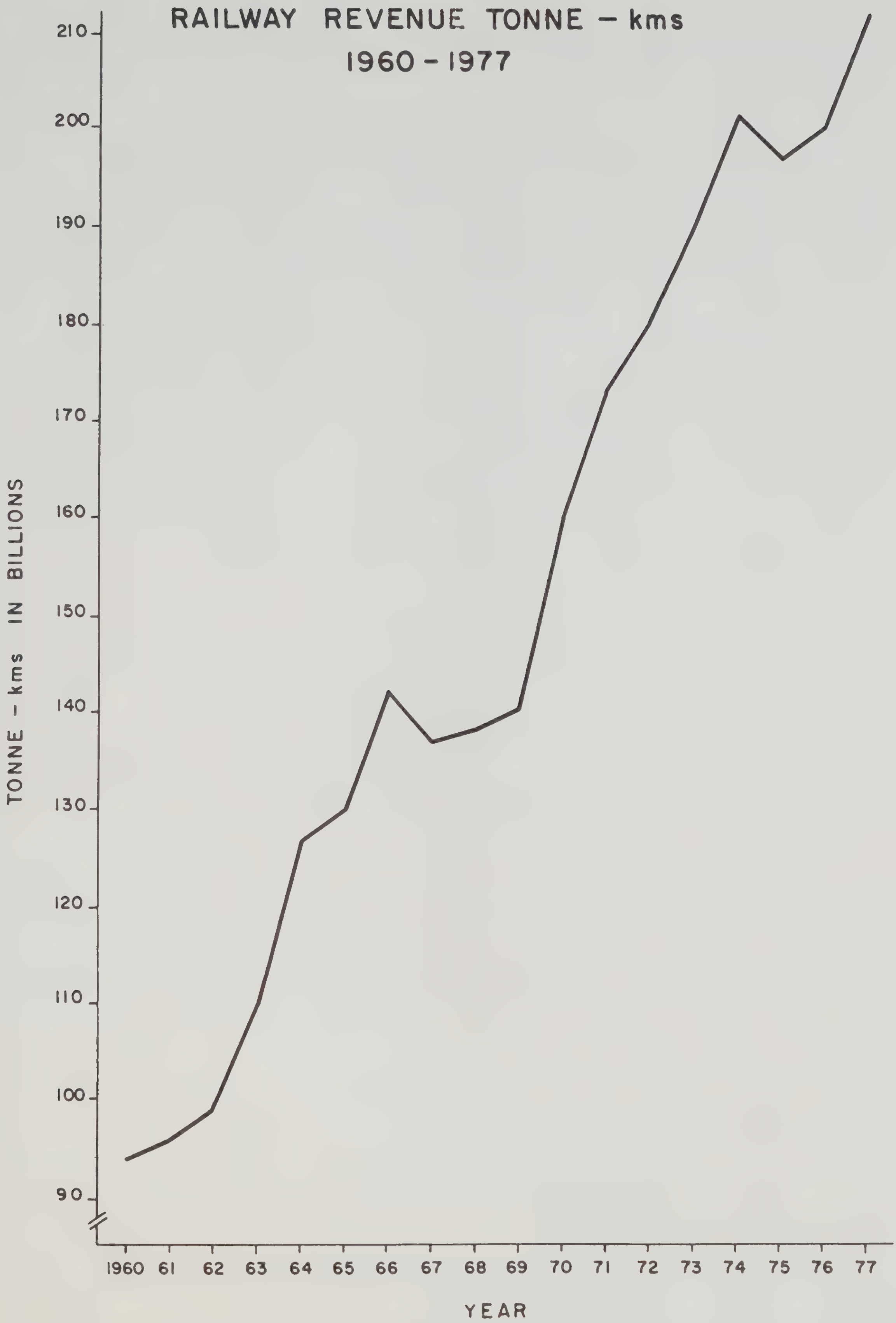
SOURCE: Statistics Canada Catalogue No. 52-208

EXHIBIT 2-3



SOURCE: Statistics Canada Catalogue No. 52 - 207

EXHIBIT 2-4



SOURCE: Statistics Canada Catalogue No. 52 - 207

3. Current Rail Passenger Services

Existing Services

The existing 1979 passenger rail services within southern and northern Ontario are shown in Figure 3.1 and Figure 3.2 respectively along with the major stations. Good service in terms of coverage and frequency is provided in a corridor extending from the Quebec border (Montreal) to Windsor. The other major routes extend to the north through the Ottawa Valley or from Toronto. In northern Ontario there are two east-west corridors, the southern route (Transcontinental) uses Canadian Pacific Railway system and the northern local service uses Canadian National Railway system. As a result of Canadian Transport Commission Hearings held in 1979, some alterations are being made in rail services. Local services between Hornepayne and Manitouwadge will be terminated in 1980 as a result of these hearings.

Local service has been temporarily maintained on the more northerly line with six weekly return trips from Capreol to Winnipeg, three return trips weekly between Capreol and Nakina and twice a week return service from Sioux Lookout to Winnipeg. This service is currently under review by the C.T.C. Some changes in the service may be expected as a result of the review.

In January 1980, the Super Continental train departing daily from Toronto was rerouted at Sudbury. The Super Continental joins with the Canadian (departing daily from Montreal) at Sudbury and continues along the CP line, through Thunder Bay, Kenora and on to Winnipeg. This service remains a daily service.

Bus Connections

The following bus services, not indicated on the map provide connections to rail service:

Ottawa to Kingston (connects with Toronto-Montreal routes)
frequency - 12 return trips weekly

Hamilton to Burlington West (connects with Toronto-London route)
- 3 return trips daily

Kapuskasing to Hearst (continuation of the Northland rail service)
- 1 return trip daily

Sudbury to Capreol (as of January 1980 connects Sudbury to northern local service originating in Capreol)
- 6 return trips per week.

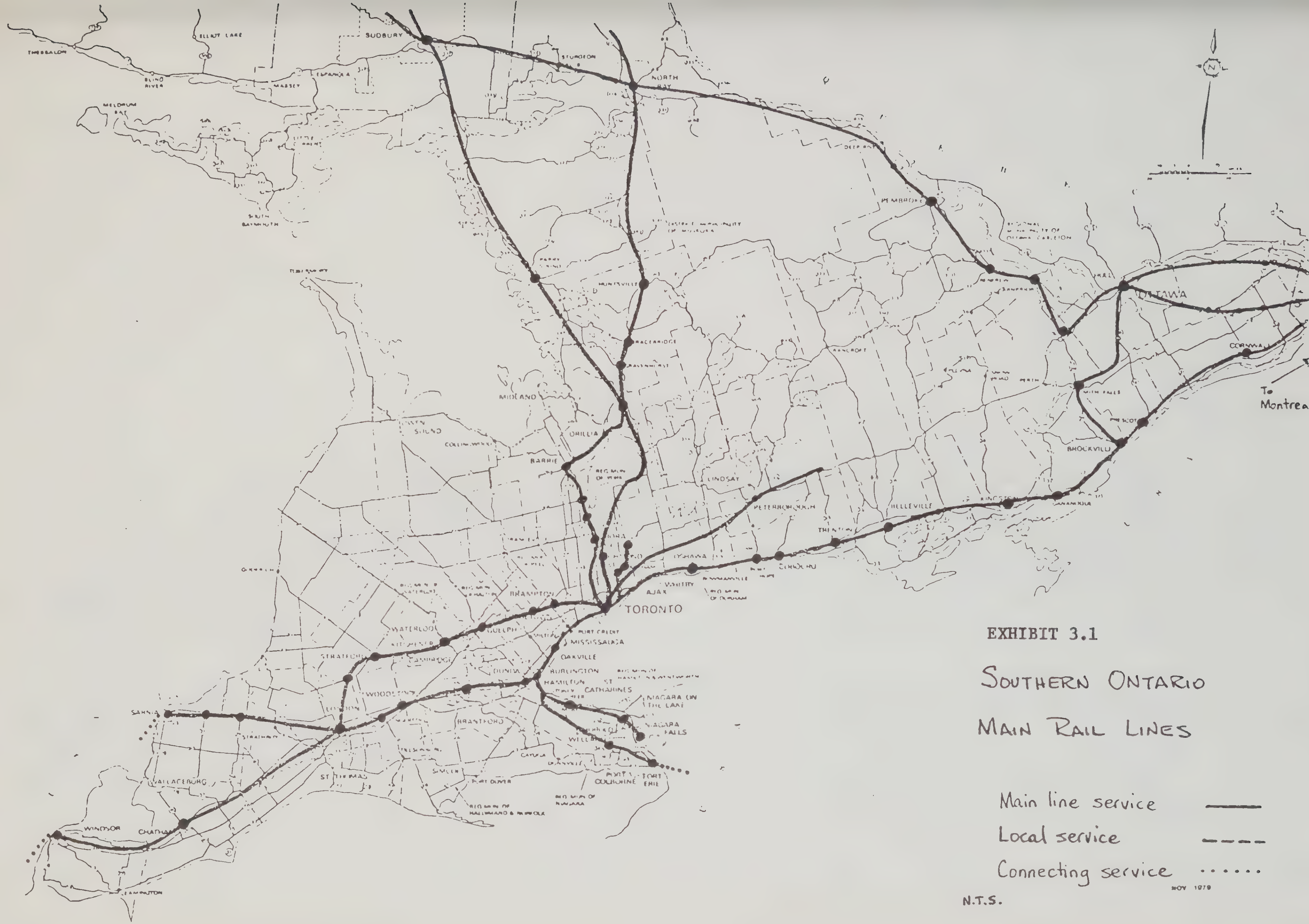


EXHIBIT 3.1

SOUTHERN ONTARIO

MAIN RAIL LINES

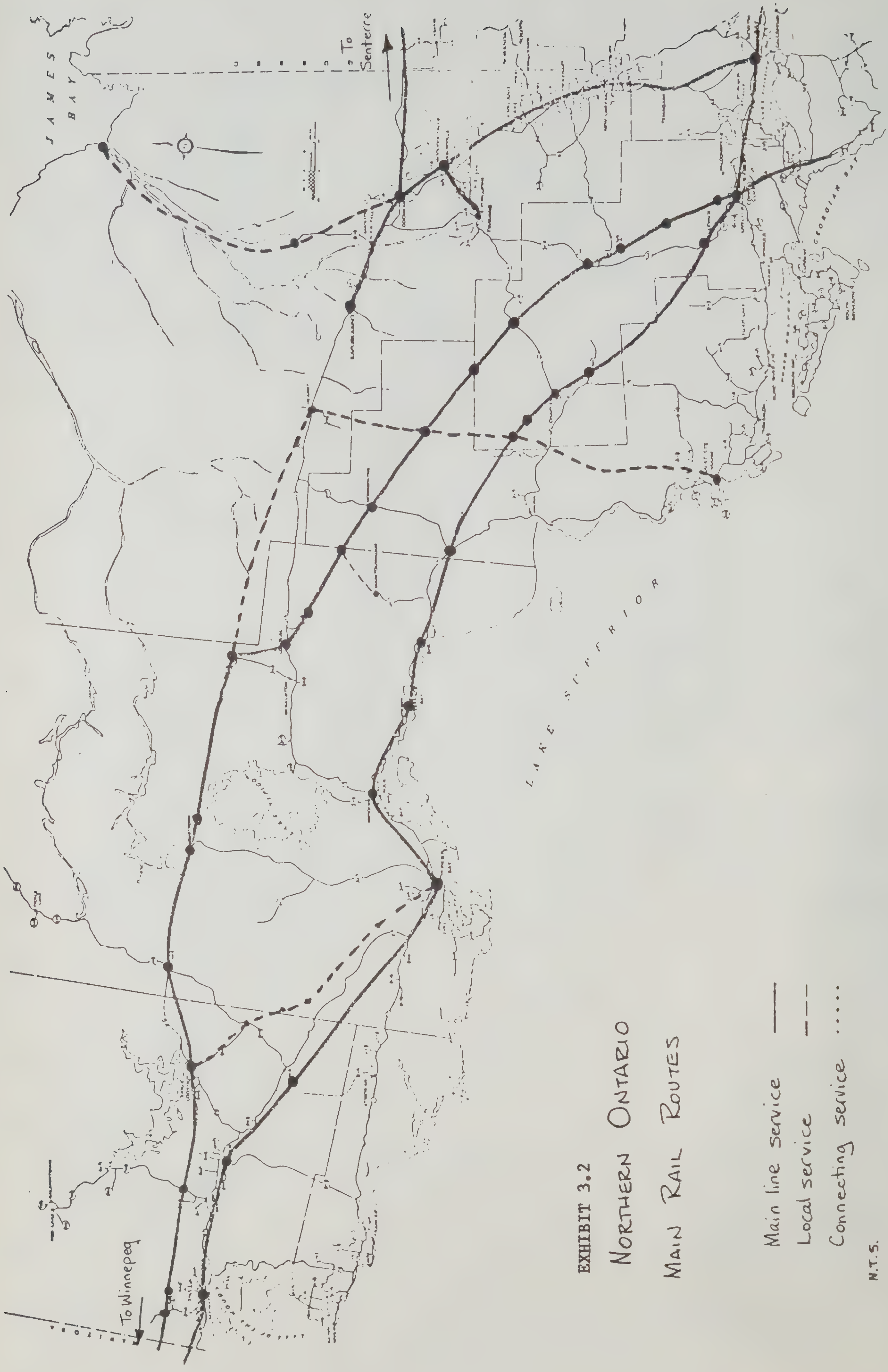


EXHIBIT 3.2
NORTHERN ONTARIO
MAIN RAIL ROUTES

In conjunction with Travelways, a bus service was initiated between Lindsay, Peterborough and Cobourg in early 1980. This bus service connects with VIA Rail services between Toronto and Montreal at a frequency of two return trips daily.

Access to Amtrak

Access to Amtrak services to various places in the U.S.A. can be made at the following Ontario locations:

Windsor/Detroit, Michigan to Chicago, Illinois	(twice daily)
Sarnia/Port Huron, Michigan to Chicago, Illinois	(daily)
Fort Erie/Buffalo, N.Y. to New York, N.Y.	(daily)

Community Service

A profile for communities with scheduled passenger rail service is shown in Exhibit 3-3. The profile provides the population (1971 and 1978), a community classification and a convenience rating. The communities are classified according to population and type of activity into one of the following:
- Metropolitan
- Major
- Activity
- Local.

The convenience rating, based on the convenience of making a return trip to a larger centre is classified as follows:

** daily return trip, departing after 7:00 A.M., returning before 11:00 P.M. on same day, minimum four hour stop over.

* return trip departing after 7:00 A.M., returning before 11:00 P.M. the next day, minimum four hour stop over during business hours.

The convenience rating is an illustrative tool relying on a set of assumptions including the selection of a particular higher order centre destination.

EXHIBIT 3-3

Population and Convenience Rating for Rail Corridor Communities

Community	Population 1971[1]	Population 1978[2]	Convenience Rating	to - Destination
1. Metropolitan Centre				
Toronto	2,045,500	2,129,000		
2. Major Centres				
Ottawa	292,000	301,300	**	Montreal
Oshawa	90,100	113,800	**	Toronto
Hamilton	301,500	308,400	**	Toronto
London	219,900	253,700	**	Toronto
Windsor	198,300	197,200	**	Toronto
Kitchener	110,600	135,300	**	Toronto
St. Catharines	106,000	124,300	**	Toronto
Thunder Bay	106,200	111,400	**	Winnipeg
3. Activity Centres				
Cornwall	45,000	46,200	**	Montreal
Brockville	19,900	20,000	*	Ottawa
Kingston	58,900	61,100	**	Toronto
Belleville	34,400	34,800	**	Toronto
Burlington	87,100	108,200	**	Hamilton
Welland	44,300	45,300	**	Buffalo, N.Y.
Peterborough	56,100	59,300	**	Toronto
Brantford	61,000	69,100	**	London
Woodstock	25,100	26,000	**	London
Sarnia	56,100	52,900	**	London
Chatham	33,700	40,000	**	Windsor
Brampton	42,600	123,800	**	Toronto
Guelph	58,600	71,300	**	Kitchener
Stratford	23,400	26,500	**	London
Niagara Falls	64,600	70,600	**	St. Catharines
Markham	36,000	61,800	**	Toronto
Richmond Hill	32,000	35,200	**	Toronto
Newmarket	17,700	25,100	**	Toronto
Barrie	26,800	35,600	**	Toronto
North Bay	46,700	50,400	**	Toronto
Timmins	27,700	44,300	**	
Sudbury	90,000	94,200	**	Toronto
Sault Ste. Marie	77,400	80,500		

EXHIBIT 3-3 (Continued)

Population and Convenience Rating
for Rail Corridor Communities

Community	Population 1971(1)	Population 1978(2)	Convenience Rating	to - Destination
4. Local Centres				
Alexandria	3,100	3,400	**	Ottawa
Casselman	1,200	1,600	**	Ottawa
Prescott	5,100	4,800	*	Brockville
Gananoque	5,100	4,900	*	Brockville
Napanee	4,500	4,800	**	Belleville
Trenton	14,200	14,800	**	Toronto
Cobourg	10,700	11,200	**	Toronto
Port Hope	8,800	10,000	**	Toronto
Smith Falls	9,500	9,000	**	Brockville
Oakville	61,700	69,900	**	Burlington
Fort Erie	22,500	23,800	**	Buffalo, N.Y.
Havelock	1,200	1,200	**	Peterborough
Dundas	19,100	16,700	**	Burlington
Ingersoll	7,800	8,300	**	Woodstock
Strathroy	6,300	8,300	**	Sarnia
Watford	1,400	1,400	**	London
Wyoming	1,300	1,500	**	London
Glencoe	1,400	1,700	**	Chatham
Georgetown	17,000	19,500(2)	**	Guelph
St. Marys	4,600	4,700	**	Stratford
Grimsby	15,500	15,300	**	Niagara Falls
Stouffville		13,200	**	Toronto
Aurora	13,100	15,000	**	Toronto
Bradford	3,300	6,600	**	Toronto
Beaverton	1,300	1,700(2)	**	Toronto
Orillia	21,800	23,600		Barrie
Gravenhurst	6,300	8,000	*	North Bay
Bracebridge	6,700	8,500	*	North Bay
Huntsville	9,300	10,700	*	North Bay
South River	1,000	1,100	*	North Bay
Temagami	1,300	1,300	**	North Bay
Cobalt	2,100	1,800	**	North Bay
New Liskeard	5,500	5,500	**	North Bay
Englehart	1,700	1,700	**	North Bay
Kirkland Lake (Swastika)	14,700	12,800	**	North Bay
Iroquois Falls (Porquois)	7,000	6,500	**	North Bay

EXHIBIT 3-3 (Continued)

Population and Convenience Rating
for Rail Corridor Communities

Community	Population 1971(1)	Population 1978(2)		Convenience Rating to - Destination
4. Local Centres (Cont.)				
Cochrane	4,900	4,700		Timmins
Smooth Rock	1,200	2,400		Timmins
Fauquier	1,400	1,400		Timmins
Kapuskasing	12,500	12,200		Timmins
Moosonee	1,300	1,300		Timmins
Parry Sound	5,500	5,200	*	Sudbury
Capreol	3,500	4,000	**	Sudbury
Hornepayne		1,700(2)		Sudbury
Longlac	1,400	2,200		Sudbury
Sioux Lookout	2,500	3,100	*	Thunder Bay
Red Lake Road	2,200	2,200		Thunder Bay
Kenora	10,800	10,000	*	Thunder Bay
Dryden	6,800	6,500	*	Thunder Bay
Ignace	830	2,100	*	Thunder Bay
Nipigon	2,600	2,500	**	Thunder Bay
Schreiber	2,100	2,000	*	Thunder Bay
Marathon	2,400	2,400	*	Thunder Bay
Chapleau	3,400	3,300		Thunder Bay
Sturgeon Falls	6,500	6,300	**	North Bay
Chalk River	1,100	1,000	*	North Bay
Carleton Place	5,000	5,600	*	Ottawa
Vankleek Hill	1,700	1,600	**	Ottawa
Manitouwadge	3,400	3,000		Sudbury
Hearst	3,500	5,200	*	Sault Ste. Marie

Convenience Rating

** return trip within 16 hours

* round trip returning following day

Source: (1) 1971 Population figures from Municipal Directory 1972
Ministry of Intergovernmental Affairs

(2) 1978 Population figures from Municipal Directory 1979
Ontario Department of Municipal Affairs

Exhibit 3.4 provides for each community the population, the frequency of service and the station activity summary. The frequency of service is based on the 1979 summer VIA schedule. The station activity summary is based on 1976 CNR services. This summary excludes information on 1976 Canadian Pacific, Algoma Central or Ontario Northland services.

Service Utilization

The usage of rail passenger service varies significantly between communities. This is partially based on size and on service frequency as well as other factors. Exhibit 3.5 shows the communities reporting the greatest amount of activity in the Windsor-Quebec corridor. These ten cities accounted for 83% of all passenger handlings in the Corridor.

The origin-destination city pairs with the largest passenger demand are shown in Exhibit 3.6. Toronto is listed in seven of the ten pairs, indicating its importance as the rail centre in the corridor and Ontario.

A representative flow of passengers between Ontario and other regions of Canada is given in Exhibit 3.7. This information is based solely on information supplied by Canadian National Railways to the C.T.C. It is therefore, limited by its lack of completeness.

Past Services and Routes

Rail services and routes have always been in a state of change. Growth in passenger services was rapid between 1860 and 1881 as shown in Exhibit 3.8. By 1951 a very extensive network of services was operating as shown on Exhibit 3.9. However, many of the services in southern Ontario had been eliminated by 1961, while northern Ontario's services remaind relatively unchanged between 1951 and 1961. Exhibit 3.11 shows a further reduction in services/routes by 1971 particularly in Mid-Western Ontario where all passenger services had been discontinued. The decline in passenger services coincided with a continual decline in passenger ridership since 1945 as shown in Exhibit 3.12. This decline was particularly consistent on the Canadian Pacific Railway system.

The reasons that contributed to both the growth and then the decline in passenger rail services over the past 100 years are many and beyond the scope of this paper. However, it should be apparent that the rail system, for many reasons has never been a static fixed system.

EXHIBIT 3-4

Population, Station Activity and

Frequency of Service

Ontario Communities

Community Name	Population 1978 (1)	Station Activity (1976)	Frequency of Service Weekly - One Way Through	Terminating
1. Metropolitan Centre				
Toronto	2,129,000	1,919,700		224
2. Major Centres				
Ottawa	301,300	314,000	7	54
Oshawa	113,800	26,500	33	
Hamilton	308,400	38,700	28	
London	253,700	576,000	62	29
Windsor	197,200	344,800		34
Kitchener	135,300	113,600	34	
St. Catharines	124,300	31,400	21	
Thunder Bay	111,400		7	2
3. Activity Centres				
Cornwall	46,200	52,300	27	
Brockville	20,000	51,500	20	21
Kingston	61,100	151,900	47	12
Belleville	34,800	97,200	33	
Burlington	108,200	45,300	63	
Welland	45,300		7	
Peterborough	59,300		7	
Brantford	69,100	131,200	57	
Woodstock	26,100	46,100	48	
Sarnia	52,900	129,500	28	
Chatham	40,000	81,800	34	
Brampton	123,800	25,200	34	
Guelph	71,300	61,500	34	
Stratford	26,500	57,000	27	7
Niagara Falls	70,600	38,200		21
Markham	61,800		5	
Richmond Hill	35,200		7	
Newmarket	25,100		14	
Barrie	35,600	89,100	15	5
North Bay	50,400	43,600	20	2
Timmins	44,300			6
Sudbury	94,200	13,700	14	6
Sault Ste. Marie	80,500			3

EXHIBIT 3-4 (Continued)

Population, Station Activity and
Frequency of Service
Ontario Communities

Community Name	Population 1978 (1)	Station Activity (1976)	Frequency of Service Weekly - One Way Through	Terminating
4. Local Centres				
Alexandria	3,400		27	
Casselman	1,600		14	
Prescott	4,800	1,600	7	
Gananoque	4,900	300	7	
Napanee	4,800	7,600	13	
Trenton	14,800	1,500	12	
Cobourg	11,200	48,300	33	
Port Hope	10,000	2,600	13	
Smith Falls	9,000	5,700	20	
Oakville	69,900	39,100	69	
Fort Erie	23,800			7
Havelock	1,200			7
Dundas	19,100		14	
Ingersoll	8,300	5,400	21	
Strathroy	8,300	5,900	21	
Watford	1,400		7	
Wyoming	1,500		7	
Glencoe	1,700	5,400	14	
Georgetown	19,500 (2)	9,200	34	
St. Marys	4,700	2,900	27	
Grimsby	15,300	4,400	21	
Stouffville	13,200			5
Aurora	14,000		5	
Bradford	6,600		5	
Beaverton	1,700 (2)		7	
Orillia	23,600		15	
Gravenhurst	8,000		15	
Bracebridge	8,500		9	
Huntsville	10,700		15	
South River	1,100		15	
Temagami	1,300		13	
Cobalt	1,800		13	
New Liskeard	5,500		13	
Englehart	1,700		13	

EXHIBIT 3-4 (Continued)

Population, Station Activity and
Frequency of Service
Ontario Communities

Community Name	Population 1978 (1)	Station Activity (1976)	Frequency of Service Weekly - One Way Through	Terminating
4. Local Centres (Cont.)				
Kirkland Lake (Swastika)	12,800		13	
Iroquois Falls (Porquois)	6,500		13	
Cochrane	4,700		7	15
Smooth Rock	2,400		7	
Fauquier	1,400		7	
Kapuskasing	12,200	4,700		7
Moosonee	1,300			9
Parry Sound	5,200		7	
Capreol	4,000		7	3
Hornepayne	1,700 (2)		10	3
Longlac	2,200		10	
Sioux Lookout	3,100	9,600	7	4
Red Lake Road	2,200		9	
Armstrong		3,900		
Kenora	10,000		7	
Dryden	6,500		7	
Ignace	2,100		7	
Nipigon	2,500		7	
Schreiber	2,000		7	
Marathon	2,400		7	
Chapleau	3,300		13	
Sturgeon Falls	6,300		7	
Chalk River	1,000		7	
Carleton Place	5,600		7	
Vankleek Hill	1,600		7	
Manitouwadge	3,000			3
Hearst	5,200		3	

Source: (1) 1978 Population figures from Municipal Directory 1979 Ministry of Intergovernmental Affairs

(2) Station Activity: Canadian Transport Commission Estimates - This material does not represent all rail passenger handlings in Ontario CP and Local CN, ONR Services excluded

(3) Frequency of Service VIA Rail Summer Schedule, 1979

EXHIBIT 3.5

Station Activity Summary (1976)
for Major Corridor Stations

Station	Handling	% Total Handlings	Rank
Toronto	1,919,700	34	1
Montreal	923,400	16	2
London	576,000	10	3
Windsor	344,800	6	4
Ottawa	314,000	6	5
Kingston	151,900	3	6
Brantford	131,200	2	7
Sarnia	129,500	2	8
Quebec	123,300	2	9
Kitchener	113,600	2	10
Sub-Total	4,727,300	83%	
Corridor Total	5,704,300	100%	

Source: C.T.C Estimates for 1976
based on C.N. Rail passenger information

EXHIBIT 3.6

Major City Pairs for
Corridor Rail Travel

City Pair	Passengers			
	City Pairs	Line Load	City Pair % Line Load	Rank
Montreal-Toronto	386,300	1,104,000	35	1
Toronto-London	238,600	1,134,100	21	2
Toronto-Windsor	213,700	422,500	50	3
Montreal-Ottawa	142,500	205,400	69	4
Kingston-Toronto	76,600	1,196,100	6	5
Toronto-Brantford	72,700	775,600	9	6
Ottawa-Toronto	67,700	129,900	52	7
Toronto-Sarnia	58,000	141,300	41	8
Belleville-Toronto	49,000	1,233,900	4	9
London-Windsor	44,400	422,500	10	10

Notes: 1. Line load at any point is the sum of the volumes on individual services operating on the particular route.

2. The percentage of city pair to line load volume is based on the lowest applicable volume for the particular city pair.

Source: C.T.C. Estimates for 1976
based on C.N. Rail passenger information

EXHIBIT 3.7

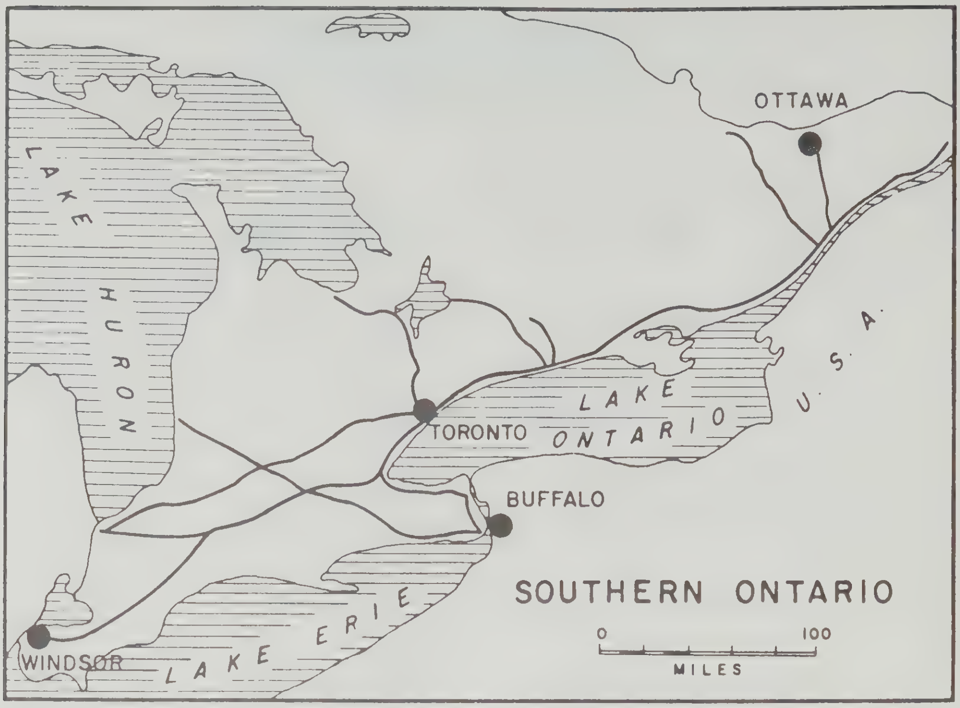
Major Passenger Flows by Region
from Ontario 1976[1] C.N. Rail Services

Region	Passengers
Montreal Area	783,000
Quebec (Remainder)	41,000
Maritimes	54,000
Prairies	44,000
British Columbia	15,000
Total	937,000

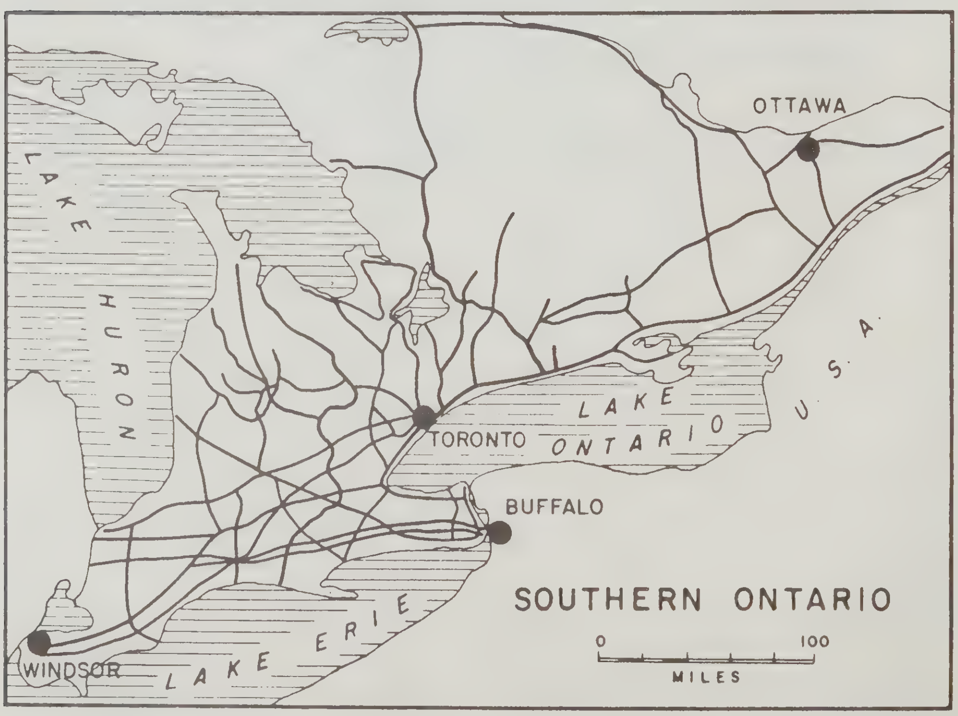
1. Represents two way passenger movement

Source: C.T.C. Estimates for 1976

EXHIBIT 3-8

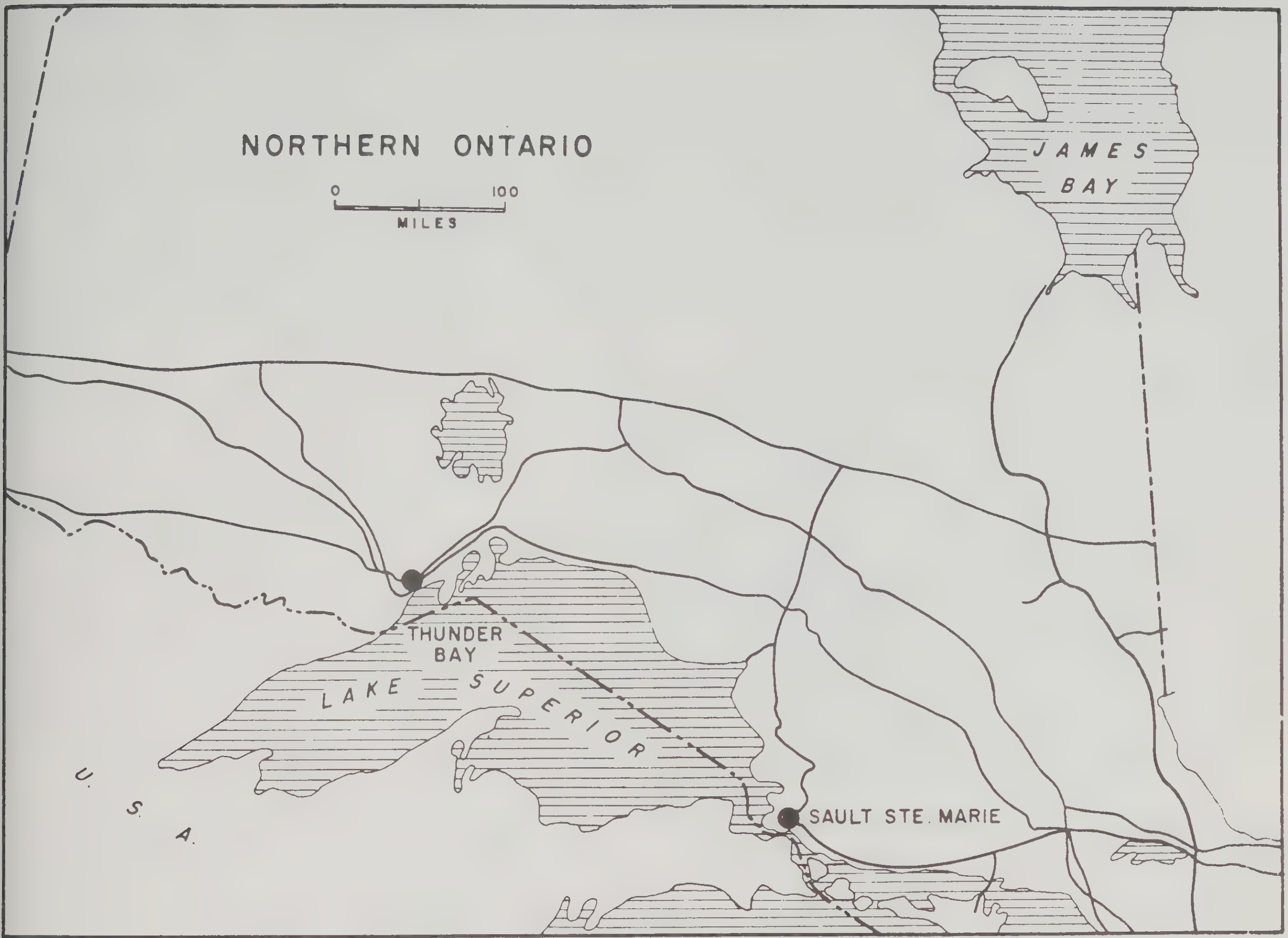


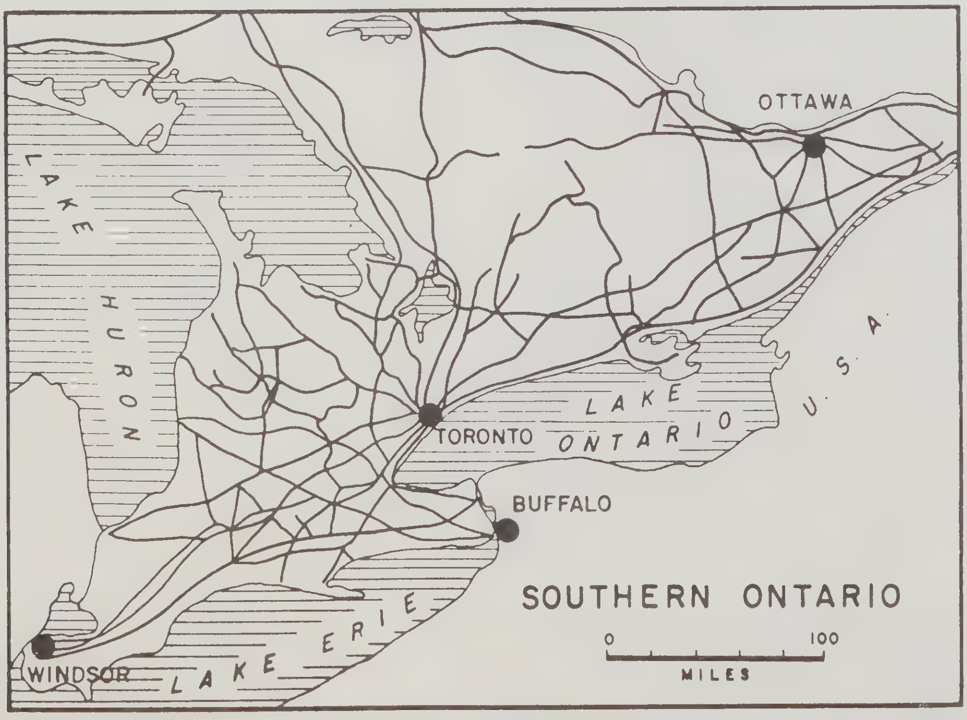
RAILWAY LINES IN SOUTHERN ONTARIO - BY 1860
(SOURCE: A HISTORY OF TRANSPORTATION IN CANADA
G.P. de T. GLAGEBROOK)



RAILWAY LINES IN SOUTHERN ONTARIO BY 1881
(SOURCE: CANADIAN ALMANAC)

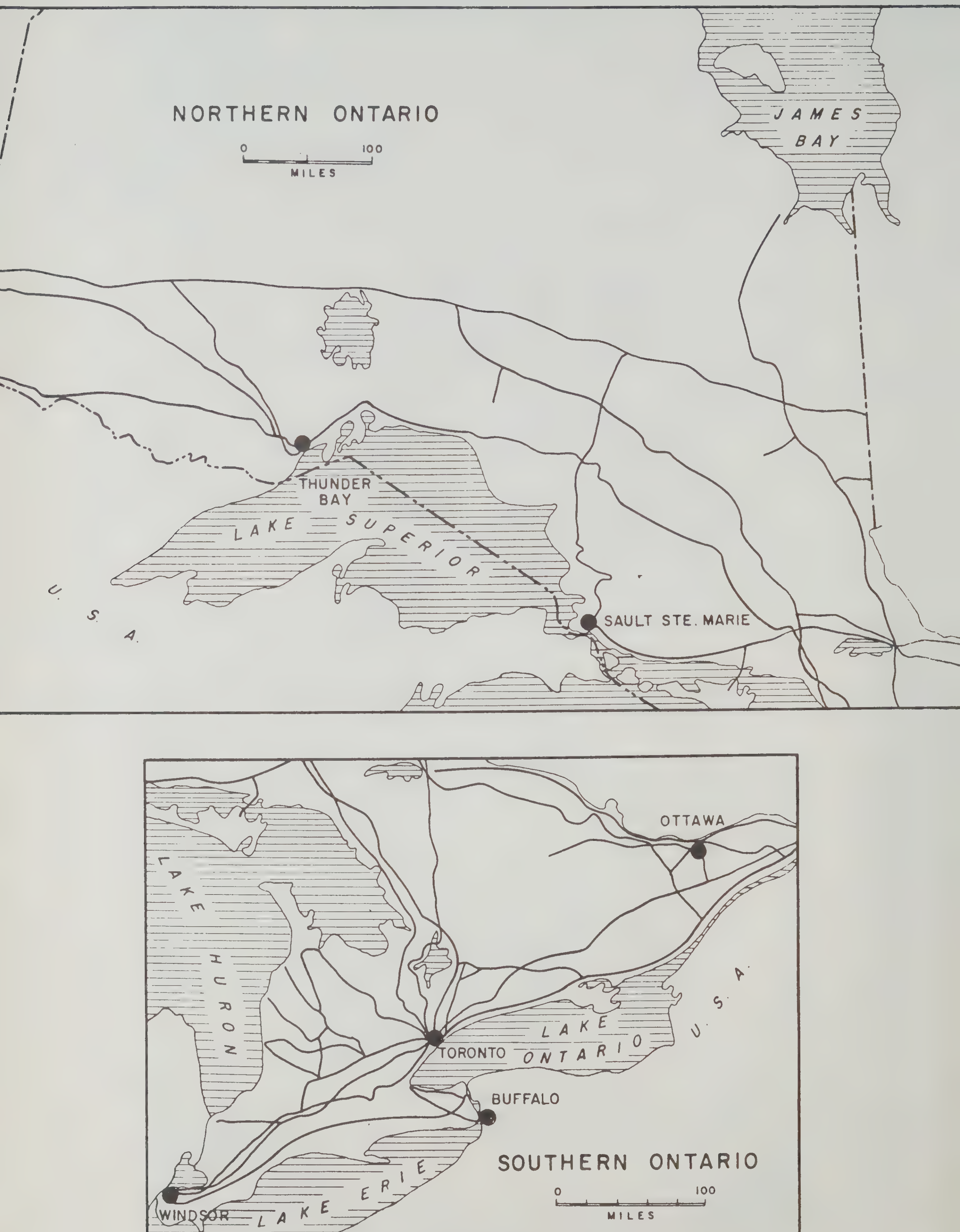
EXHIBIT 3-9





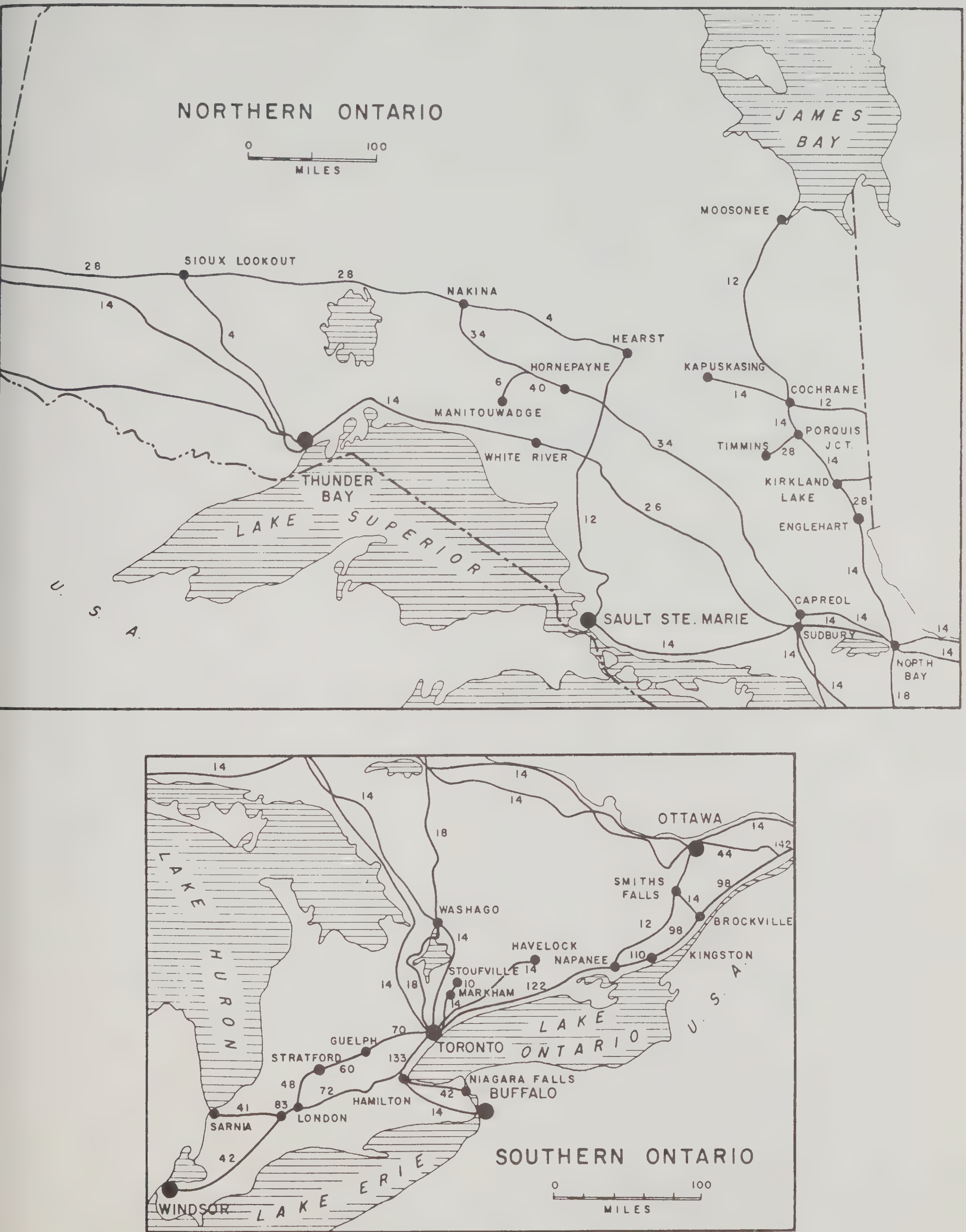
RAIL LINES WITH PASSENGER SERVICE -1951
(SOURCE: CANADIAN GUIDE, JULY 1951)

EXHIBIT 3-10



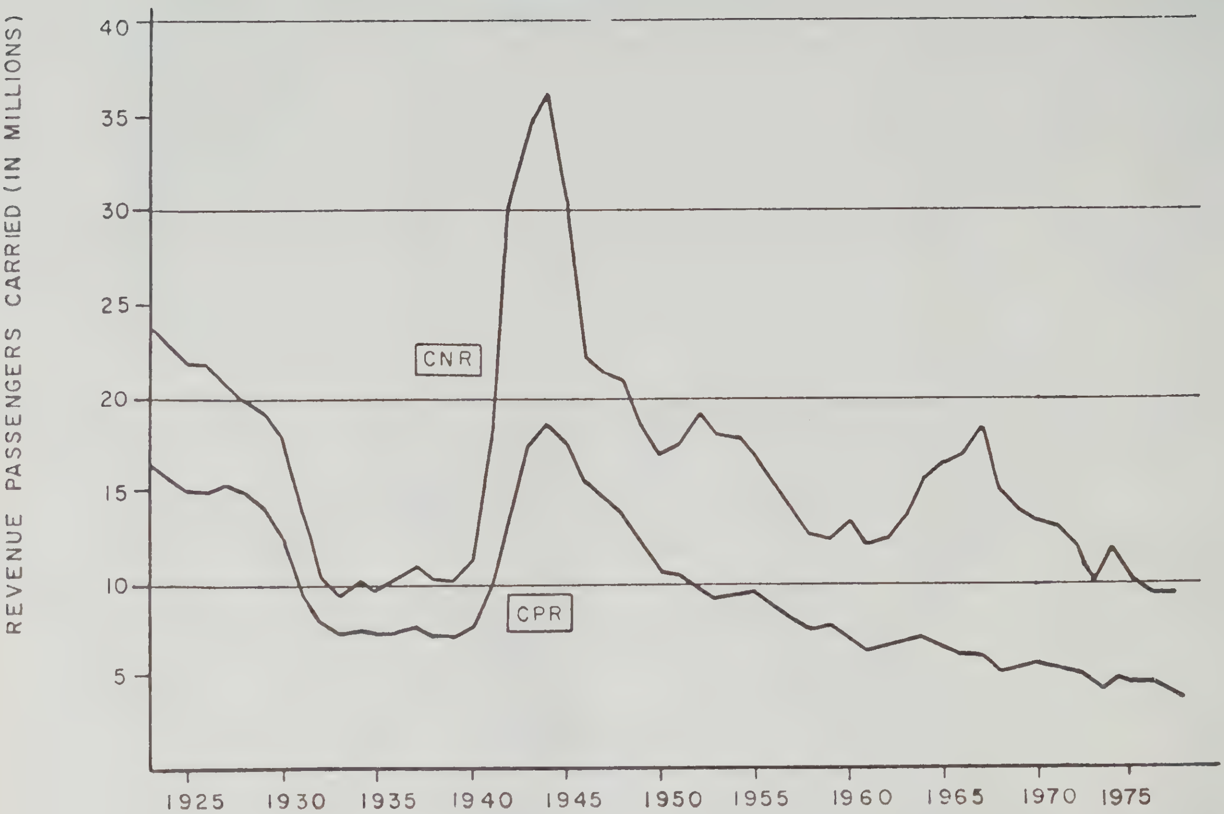
RAIL LINES WITH PASSENGER SERVICE-1961
(SOURCE: CANADIAN GUIDE, JULY 1961)

EXHIBIT 3-11

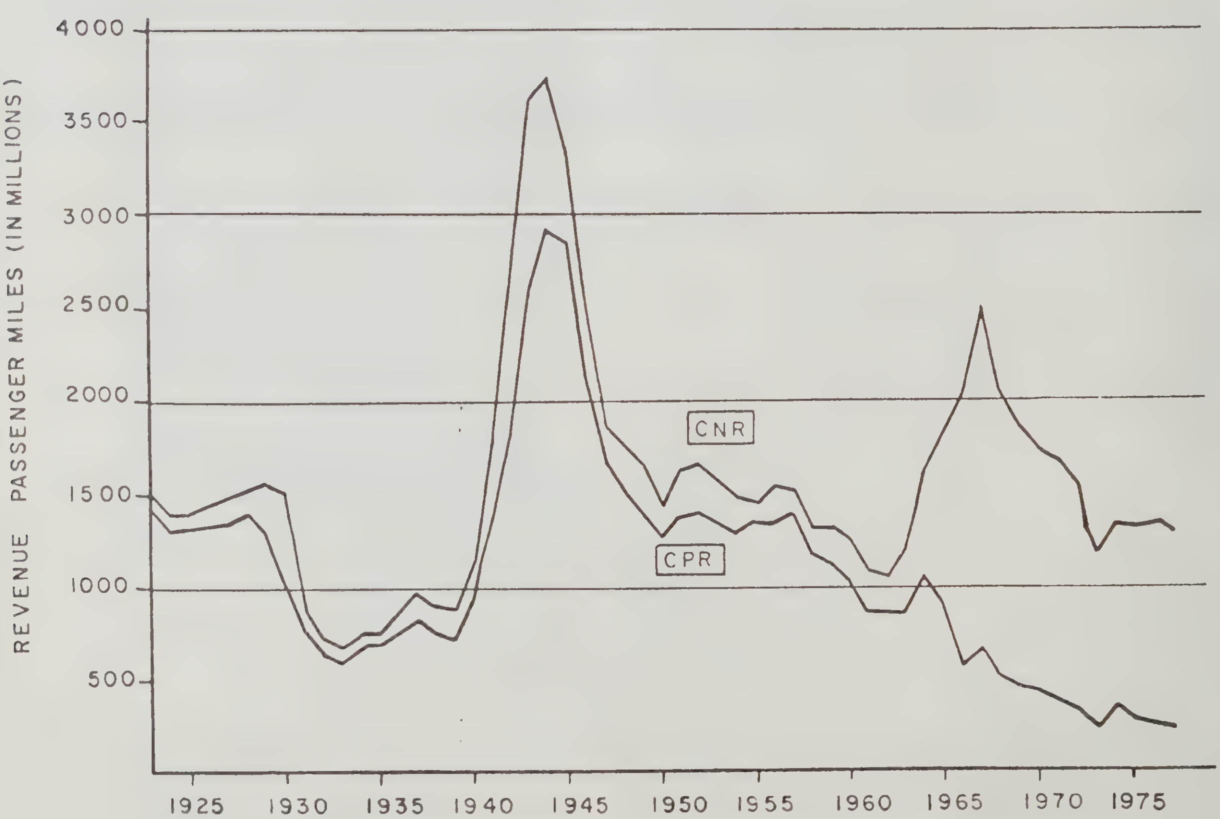


PASSENGER TRAIN FREQUENCY 1971 (TRAINS/WK., BOTH DIRECTIONS)
(SOURCE: CANADIAN GUIDE, AUGUST 1971)

EXHIBIT 3-12



REVENUE PASSENGERS CARRIED, CNR AND CPR 1923-1977



REVENUE PASSENGER MILES, CNR AND CPR 1923-1977

(SOURCE: STATISTICS CANADA, CATALOGUES 52-201, 52-202: 1970; 52-213, 1971-1975; 52-210, 1976-77)

4. Rail User Characteristics in Selected Corridors

Information from a variety of sources and dates has been compiled for some of the major corridors including the following:

- the Western Transcontinental
- Toronto - Ottawa/Montreal
- Toronto - Sarnia/London/Windsor
- Toronto - Timmins/Kapuskasing
- Toronto - Niagara Falls/Buffalo

These corridors have been studied by many different agencies or levels of government throughout the 1970's. As a result, data is relatively plentiful, however much of it is five years or more old. The basic thrust of the data appears to be valid today (i.e. trip purpose) although some items will have changed (i.e. income).

Exhibit 4-1 shows a gradual improvement in rail ridership for three major city pairs between 1974 and 1978. Within the same time period and for the same city pairs, the bus and air modes had no growth.

In a recent study of multimodal travel (Exhibit 4-2) rail was found to have a relatively minor share of the total volume. The automobile was the overwhelming choice, with air services playing a significant part on the longer trips. Rail services do hold a significant share of the Toronto-Montreal traffic.

Various user characteristics in terms of trip purpose, occupation and income for three corridors are shown in Exhibits 4-3, 4-4 and 4-5. This information, in all cases has been based on relatively small samples. The exhibits indicate the following about rail user characteristics:

- non business reasons for travel dominate the trip purpose in all corridors
- occupational background varies significantly by corridor
- rail users would appear to be significantly above average in terms of income. The average income in Ontario for 1975 was $9,246 and for 1977 it was $11,087.

Some of this information should be treated with caution. As an example the Toronto-London/Windsor trains reported over 35% of ridership as students. This was the largest occupational group. Yet the income figures appear to be in contradiction of the occupational findings. The survey found that

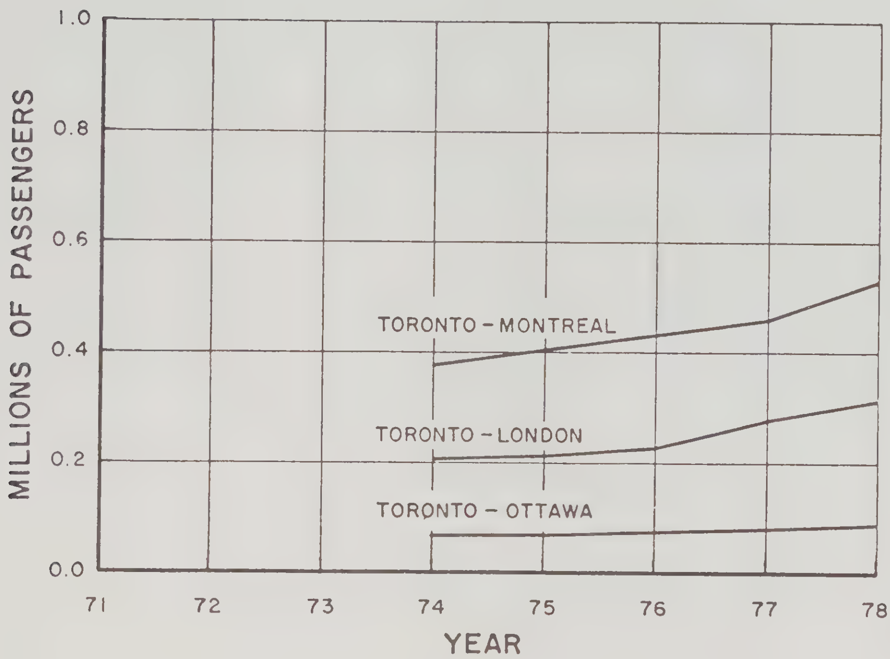
more than 55% of the respondents reported an income over $15,000 (1975) whereas for the general population less than 25% reported an income over that level. A similar pattern is found in the Toronto-Ottawa/Montreal survey. Over 60% of the rail ridership reported a 1977 income over $15,000 compared to 26% of the general population. It would therefore appear that the income distribution, reported from the limited samples may be biased to the higher levels.

One difficulty is apparent in reviewing the trip characteristics data. It is difficult to directly compare the separate data sets in terms of trip purpose or occupation. Some standardization of the data collection efforts would be beneficial in this area.

EXHIBIT 4-1

RAIL REVENUE PASSENGER VOLUMES
FOR SELECTED CITY PAIRS
1974 — 1978

(PASSENGERS IN MILLIONS)[1]



[1] 1978 IS ESTIMATED.
INCLUDES ONLY TRIPS MADE BETWEEN THE SPECIFIC CITY PAIRS

EXHIBIT 4-2

ANNUAL PERSON TRIPS BY MODE
BETWEEN TORONTO AND 6 URBAN CENTRES
1976

CITY PAIR	TRIPS ('000'S)				
	AIR	RAIL	BUS	AUTO	TOTAL
TORONTO - MONTREAL	992	454	130	1070	2646
TORONTO - OTTAWA	501	76	245	1100	1922
TORONTO - LONDON	30	293	135	2141	2599
TORONTO - WINDSOR / DETROIT	150	231	88	1620	2089
TORONTO - SUDBURY	90	31	79	300	500
TORONTO - NORTH BAY	26	20	41	280	367
TOTAL TORONTO	1789	1105	718	6511	10123
MARKET SHARE (%)	18	11	7	64	100

SOURCE : VARIOUS CARRIER AND OFFICIAL STATISTICS.

EXHIBIT 4-3a

Corridor Rail Passenger Project

Market Assessment

Trip Purpose (1975) by Percentage

PURPOSE	TORONTO-LONDON %	TORONTO-WINDSOR %
Business	20.2	19.3
Personal	6.3	9.3
Pleasure	22.4	13.7
Visits	51.1	57.8
TOTAL	100	100
Trips	272	161

EXHIBIT 4-3b

Corridor Rail Passenger Project

Market Assessment (1975)

Occupational Breakdown by Percentage

Occupation	Toronto-London %	Toronto-Windsor %
Clerical	13.6	12.4
Executive	9.2	5.0
Housewife	16.5	8.1
Labourer	1.8	5.6
Professional	14.3	24.2
Retired	2.2	1.9
Sales	3.7	2.5
Student	38.2	36.0
Unemployed	.4	4.3
TOTAL	100	100
Number	272	161

EXHIBIT 4-3c

Corridor Rail Passenger Project

Market Assessment

Income Distribution by Route 1975

INCOME $	TORONTO-LONDON Percent	TORONTO-WINDSOR Percent
Refused	0.0	0.0
Undefined	11.0	3.7
0 - 5,000	9.6	2.5
5 - 7,000	4.4	1.9
7 - 10,000	8.5	3.7
10 - 15,000	10.7	19.3
15 - 25,000	23.2	47.2
25,000 +	32.7	21.7
TOTAL	100.0	100.0
Number	272	161

Income Distribution in Ontario[1]

INCOME $	ONTARIO Percent
0 - 5,000	35
5 - 7,000	12
7 - 10,000	16
10 - 15.000	21
15 - 25,000 25,000 +	16
AVERAGE	$ 9,257

1. Financial Post Survey of Markets

EXHIBIT 4-4a

Survey of Toronto-Montreal-Ottawa Triangle
Transportation Development Agency 1977

Percentage Breakdown of
Trip Purpose for Rail Passengers

	MONTREAL-OTTAWA %	OTTAWA-TORONTO %	TORONTO-MONTREAL %
Business	30	25	31
Non-Business	70	75	69

EXHIBIT 4-4c

Survey of Toronto-Montreal-Ottawa Triangle
Transportation Development Agency 1977

Income Breakdown for Rail Passengers

INCOME LEVEL $	MONTREAL-OTTAWA	%	OTTAWA-TORONTO	%	TORONTO-MONTREAL	%
No Income	47	17	36	14	32	17
0 - 5,000	4	1	6	2	1	-
5 - 7,000	3	1	4	1	7	4
7 - 10,000	11	4	12	5	6	3
10 - 15,000	42	15	47	18	24	13
15 - 25,000	100	36	91	35	64	35
25,000 +	69	25	64	25	49	27
Total	276	100	260	100	183	100

Income Breakdown for Ontario Residents[1]

INCOME LEVEL $	ONTARIO %
0 - 5,000	30
5 - 7,000	12
7 - 10,000	12
10 - 15,000	19
15 - 25,000	21
25,000 +	6
AVERAGE INCOME	$11,087

1. Financial Post Survey of Markets

EXHIBIT 4-5

Northeastern Ontario Rail Ridership

Trip Characteristics

Trip Purpose	
Business	4%
Personal Business	24%
Social & Recreational	61%
Commuting	2%
Other	9%

Occupation	
Student	13%
Retired	13%
Unemployed	6%
Clerical	8%
Executive/Managerial	6%
Technician	10%
Professional	19%
Sales/Service Work	6%
Other	19%

EXHIBIT 4.6

Comparison of User Characteristics by Mode

Toronto - Montreal Travel

	Rail	Bus	Air	Auto
Trip Purpose %				
Work/Business	30	10	87	40
Non Work/Business	70	90	13	60
Average Party Size Persons	1.8	1.6	1.3	2.3

The basic service characteristics of frequency, travel time and cost for rail, bus, air and auto are presented in Exhibit 4-7. Air service is the quickest, both in the mode and from door to door. It also has the highest frequency and highest cost. Rail and bus are highly competitive in terms of travel time and fare although bus is generally more frequent. Rail has certain advantage over the bus in the medium to long distance travel market, with its provision of on-board meal and sleeping facilities.

Exhibits 4-8a and 8b show the monthly variation in rail ridership for Toronto-Windsor/Sarnia and Toronto-Montreal respectively. Passenger traffic peaks correspond to the major holidays throughout the year. Other routes, such as the transcontinental rail service show a much greater variation in ridership throughout the year with the peak monthly flow being three times that of the flow in an off peak month.

The daily variation in passenger traffic for three services in Southwestern Ontario is shown in Exhibit 4-9. Generally Friday and Sunday are the heaviest days of usage, corresponding to weekend trips for non-business purposes, such as visiting, recreational or personal. On some routes the peak day usage is twice an average weekday. This presents some problems to the rail operators in terms of having sufficient capacity for the peaks and a trimmed operation for non peak periods.

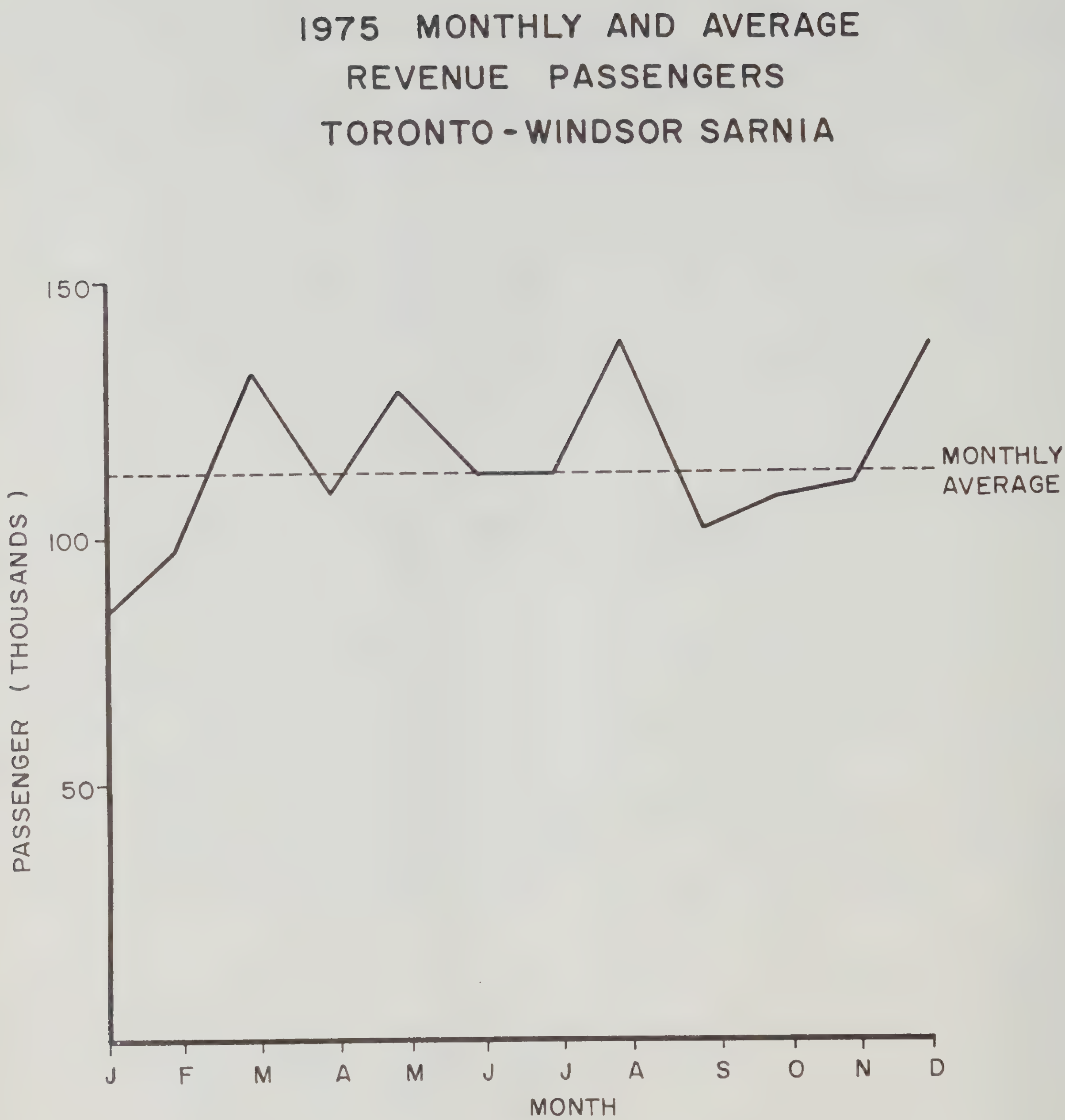
EXHIBIT 4-7

COMPARISON OF SERVICE CHARACTERISTICS
BY MODE FOR SELECTED CITY PAIRS
1977

	DAILY FREQUENCY	TRAVEL TIME (HOURS) IN MODE	TRAVEL TIME (HOURS) TOTAL	COST FARE	COST TOTAL	MARKET SHARE
TORONTO-MONTREAL[1]						
BUS	7	6:35	7:50	19.85	23.30	
RAIL	7	4:35	5:45	22.25	25.65	
AIR	24	1:05	3:10	56.00	60.00	
AUTO		6:35	6:35	16.60	16.60	
TORONTO-OTTAWA[1]						
BUS	13	5:05	6:15	15.75	18.60	
RAIL	3	5:30	6:45	16.50	19.55	
AIR	16	0:45	2:40	47.00	50:60	
AUTO		5:35	5:35	12.40	12.40	
TORONTO-THUNDER BAY						
BUS	3	20:30	21:40	48.84	48.84	
RAIL	1	20:00	21:30	47.00	50.50	
AIR	6	1:35	2:45	73.00	71.32	
AUTO		31:05	31:05	54.00	54.00	
TORONTO-VANCOUVER						
BUS	2	72:10	73:25	95.45	89.80	
RAIL	1	66:15	68:10	98.00	104.20	
AIR	8	4:45	6:40	191.00	196.50	
AUTO		129:00	129:00	200.00	200.00	

1. Source adapted from Transport Canada; Canpass Data Base

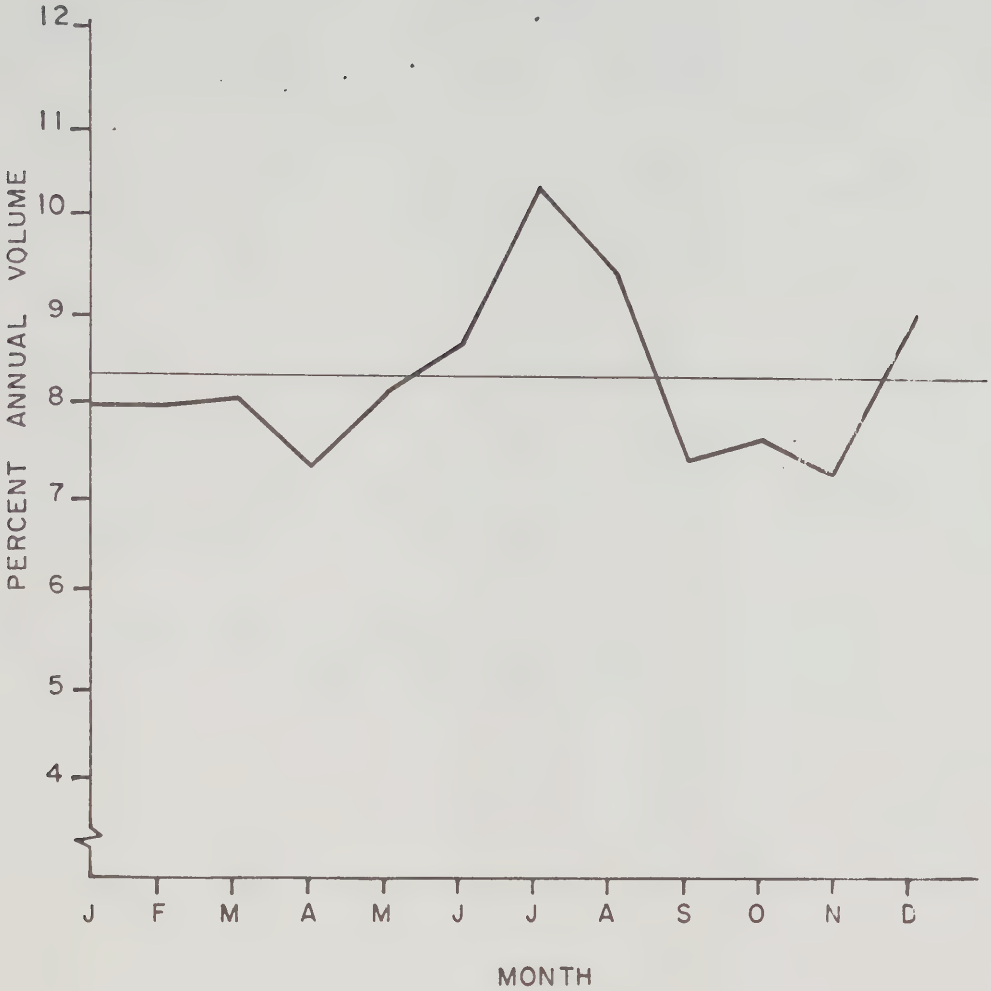
EXHIBIT 4-8a



SOURCE:- A STUDY TO DEVELOP FOR AN IMPROVEMENT OF RAIL (PASSENGER) SERVICE FOR THE TORONTO / LONDON / WINDSOR ROUTE, CANALOG LOGISTICS LIMITED

EXHIBIT 4-8b

MONTHLY VARIATION IN PASSENGERS
TORONTO - MONTREAL SERVICE
1976



SOURCE: CANADIAN TRANSPORT COMMISSION ESTIMATES

EXHIBIT 4-9

SUMMARY OF DAILY VARIATION IN PASSENGERS HANDLED PER TRAIN

TORONTO-LONDON/WINDSOR/SARNIA

ROUTE	AUGUST 1974 (TYPICAL PEAK MONTH)				JUNE 1975 (AVERAGE MONTH)			
	WEEKDAY	FRI	SAT	SUN	WEEKDAY	FRI	SAT	SUN
TORONTO-WINDSOR	173	308	235	339	140	325	194	315
TORONTO-SARNIA	179	208	157	142	97	162	91	162
TORONTO-LONDON	118	91	129	83	67	86	70	57

SOURCE: A STUDY TO DEVELOP FOR AN IMPROVEMENT OF RAIL (PASSENGER) SERVICE FOR THE TORONTO/LONDON/WINDSOR ROUTE VOLUME II - APPENDICES: CANALOG LOGISTICS LIMITED

PASSENGER USAGE BY ROUTE AND CORRIDOR

A summary of Ontario rail ridership for 1977 and 1978 is provided in Exhibits 4-10 and 4-11. The 1977 information shows approximately three million revenue passengers used the rail system, with an average trip distance per passenger of 164 miles. However, only two routes had longer trip distances (Toronto-Montreal - 275 and Ottawa-Brockville-Toronto - 175). The average load factor was 39% but only one route had an above average load factor. Load factors of less than 20% were observed on routes with shorter average passenger trip lengths.

Exhibit 4-11 shows similar information to Exhibit 4-10 discussed above. The 1978 summary shows a significant improvement in passengers, passenger miles and in the load factor. However, these improvements tend to be concentrated in three main routes. The average trip length also increased from 1977 with increases occurring on all routes.

Exhibit 4-12 provides for a variety of routes throughout Ontario the 1978 ridership summary. Both the average trip length and the load factor for many services in the north are less than values observed in the corridor. Only the Western Transcontinental service had an average trip length (886 miles) longer than the Toronto-Montreal route. This distance would approximate Toronto-Thunder Bay, which takes 24 hours of travel.

Exhibit 4-13 provides similar information and includes the average seating capacity for the services. The seating capacity was derived from the train miles operated and the seat miles available.

EXHIBIT 4-10

1977 CORRIDOR RAIL RIDERSHIP SUMMARY

CORRIDOR/ROUTE	PASSENGERS	PASSENGER MILES (000's)	SEAT MILES (000's)	LOAD FACTOR (%)	TRIP LENGTH (MILES)
Toronto-Montreal/Ottawa					
Ottawa-Belleville-Toronto	19,292	2,525	7,839	32.2	131
Toronto-Kingston	114,090	13,482	43,722	30.8	118
Montreal-Ottawa	224,526	24,032	66,343	36.2	107
Ottawa-Brockville-Toronto	330,454	57,850	158,447	36.5	175
Montreal-Toronto	905,211	249,087	496,304	50.2	275
Sub-Total	1,593,573	346,976	772,655	44.9	218
Toronto-London/Sarnia/Windsor					
Toronto-Stratford	45,921	2,617	14,163	18.5	57
Toronto-Windsor	792,513	114,205	310,463	36.8	144
Toronto-London-Sarnia	675,895	59,729	210,821	28.3	88
Sub-Total	1,514,329	176,551	535,447	33.0	116
Toronto-Niagara Falls					
Toronto-Niagara Falls	131,229	7,668	39,990	19.2	58
TOTAL	3,239,131	531,195	1,348,092	39.4	164

SOURCE: CTC Corridor Rail Passenger Services (Review of Fares and Revenue)

EXHIBIT 4-11

CORRIDOR RAIL RIDERSHIP SUMMARY - 1978

CORRIDOR/ROUTE	PASSENGERS (000's)	PASSENGER MILES (000's)	SEAT MILES (000's)	LOAD FACTOR (%)	TRIP LENGTH (MILES)
Toronto-Montreal/Ottawa					
Toronto-Kingston	123.5	14,577	44,380	33	118
Montreal-Ottawa	270.7	30,856	83,716	37	114
Ottawa-Toronto	392.6	69,886	156,383	45	178
Montreal-Toronto	1,141.7	317,400	514,476	62	278
Sub-Total	1,928.5	432,719	798,955	54	224
Toronto-London/Sarnia/Windsor					
Toronto-Stratford	52	3,117	13,277	23	60
Toronto-Windsor	914	131,702	330,028	40	144
Toronto-London-Sarnia	692	62,959	215,332	29	91
Sub-Total	1,658	197,778	558,637	35	119
Toronto-Niagara Falls					
Toronto-Niagara Falls	148.5	9,357	38,490	24	63
TOTAL	3,735	639,854	1,396,082	45	171

SOURCE: Correspondence with Rail Passenger Directorate, Transport Canada, April 1980

EXHIBIT 4-12

1978 ONTARIO RAIL RIDERSHIP SUMMARY

	Total Revenue Passengers (000's)	Revenue Passenger Miles (000's)	Seat Miles Available (000's)	Train Miles (000's)	Average Trip Length (Miles)	Load Factor %
Sudbury-White River	8.9	923	N/A	141	103.7	
Toronto-Stouffville	117.0	2,350	4,440	15	20.1	53
Toronto-Havelock	102.0	4,400	10,184	61	43.1	43
Toronto-North Bay-Kapuskasing	70.0	12,235	62,089	272	174.8	20
Hornepayne-Manitouwadge	.1	4	681	20	40.0	1
Hearst-Nakina	.6	49	1,408	44	81.7	3
Thunder Bay-Sioux Lookout	1.7	160	2,353	42	94.1	7
Toronto-Kingston	123.5	14,577	44,380	199	118.0	33
Ottawa-Toronto	392.6	69,886	156,383	667	178.0	45
Toronto-Stratford	52.0	3,117	13,277	65	59.9	23
Toronto-Niagara Falls	148.5	9,357	38,490	179	63.0	24
Toronto-Sarnia	691.9	62,959	215,332	874	91.0	29
Montreal-Toronto	1,147.7	317,400	514,476	1,150	278.0	62
Toronto-Windsor	914.6	131,702	330,028	790	144.0	40
Montreal-Ottawa	270.7	30,856	83,716	514	133.9	37
Toronto-Hamilton	18.0	921	6,578	59	51.2	14
*Nakina-Capreol	N/A	N/A	N/A			
*Toronto-Barrie	N/A	N/A	N/A			
Winnipeg-Sioux Lookout	1.1	100	1,224	51	90.9	8
Quebec-Cochrane-Noranda-Chambord-Dolbeau	69.5	11,201	75,589	457	161.2	15
Western Transcontinental (Toronto-Montreal-Vancouver)	704.3	624,600	N/A	4,846	886.8	

* Included in Western Transcontinental

SOURCE: Correspondence with Rail Passenger Directorate, Transport Canada, April 1980

EXHIBIT 4-13

1978 SUMMARY OF RAIL PASSENGER SERVICES

	Total Revenue Passengers (000's)	Revenue Passenger Miles (000's)	Seat Miles Available (000's)	Capacity Available Seats/Train
Sudbury-White River	8.9	923	N/A	N/A
Toronto-Stouffville	117.0	2,350	4,440	296
Toronto-Havelock	102.0	4,400	10,184	167
Toronto-North Bay-Kapuskasing	70.0	12,235	62,089	228
Hornepayne-Manitouwadge	.1	4	681	34
Hearst-Nakina	.6	49	1,408	32
Thunder Bay-Sioux Lookout	1.7	160	2,353	56
Toronto-Kingston	123.5	14,577	44,380	223
Ottawa-Toronto	392.6	69,886	156,383	234
Toronto-Stratford	52.0	3,117	13,277	204
Toronto-Niagara Falls	148.5	9,357	38,490	215
Toronto-Sarnia	691.9	62,959	215,332	246
Montreal-Toronto	1,141.7	317,400	514,476	447
Toronto-Windsor	914.6	131,702	330,028	417
Montreal-Ottawa	270.7	30,856	83,716	163
Toronto-Hamilton	18.0	921	6,578	111
*Nakina-Capreol	N/A	N/A	N/A	N/A
*Toronto-Barrie	N/A	N/A	N/A	N/A
Winnipeg-Sioux Lookout	1.1	100	1,224	24
Quebec-Cochrane-Noranda-Chambord-Dolbeau	69.5	11,201	75,589	165
Western Transcontinental (Toronto-Montreal-Vancouver)	704.3	624,600	N/A	

* Included in Western Transcontinental

SOURCE: Correspondence with Rail Passenger Directorate, Transport Canada

5. Operating Characteristics of Passenger Rail Service

This chapter looks at several of the important operating characteristics including the financial, the energy and the equipment aspects of existing services.

FINANCIAL

Several of the characteristics are combined in Exhibit 5-1 to show, for 11 corridor routes, the revenue passengers and mileage, the operating losses and the load factors for the 1972-1977 period. Since 1975, revenue passengers and mileage, after several years of decreases, are increasing and approaching the 1972 levels. In the same time period operating losses have increased substantially although they have remained relatively stable over the recent years. The load factors which have declined over the 5 year period, show substantially greater passenger volumes could be handled with the existing passenger equipment. The load factor for rail service in the Windsor-Quebec City corridor is less than either air (67%) or bus (75%) on the busiest routes such as Toronto-Montreal. On this route, for instance, the rail load factor is currently about 55%.

Exhibits 5-2 and 5-3 summarize the financial performance for 1974 and 1977 respectively of rail passenger service in 5 major corridors. In reviewing the information note the following points:

- costs have risen substantially (42%)
- revenues have risen modestly (14%)
- revenues are covering a decreasing share of costs.

For many routes, under existing fare policies, it would require load factors well in excess of 100% for the revenues to equal costs.

Due to Ontario's initiatives in Northeastern Ontario the financial aspects do become more involved in this corridor. Exhibit 5-4 summarizes the 1978 financial data in terms of costs, revenues and loss for train services. The share of the operating losses for each of the services is recorded. In 1978, Ontario supported a much larger share of the operating loss than did the federal government for services in this corridor.

Estimates for the 1980 operations of Northeastern Ontario passenger rail services are presented in Exhibit 5-5. Revenues, costs and losses are all expected to increase by 30% over the 1978 level.

ENERGY

The energy characteristics for four routes and various trains are summarized for 1977 in Exhibit 5-6. At present it is not possible to calculate the energy usage in terms of passenger-miles since the corresponding passenger data is currently not available on an individual train basis. The actual quality of the data is also questionable. Exhibit 5-7 compares the reported fuel consumption in 1973 and 1977 for several services. In each case, the fuel consumption, on a seat mile basis has doubled without the apparent corresponding service changes. These differences point out the difficulty in obtaining a reliable measure of the fuel efficiency of rail services and a suitable measure for comparing with other modes. The railways are taking several steps to improve their control on the fuel distribution within the rail system. One such step is the placing of metering devices on the fuel pumps.

SERVICE RELIABILITY

The measure of reliability used in evaluating the performance of passenger trains is their ability to be "on time" in relation to their published schedule. The railways maintain records of the performance of the transcontinental service for specific points across the country. Exhibit 5-7 provides a graphical representation of the performance of the Supercontinental eastbound and westbound for 1975, Exhibit 5-9 provides the same information for the Canadian. Trains arriving up to 15 minutes late are grouped together with on-time arrivals, other categories of lateness are 16 to 60 minutes and over 60 minutes. As can be determined from the graphs CN had a slightly better performance record westbound and a considerably better record eastbound in arriving at a location at its scheduled time in comparison to CP.

In order to read the graphs one must compare trains in the eastbound or westbound direction. Where routes diverge equivalent locations would be CN Capreol to CP Sudbury; CN Armstrong to CP Thunder Bay; CN Saskatoon to CP Regina; and CN Edmonton to CP Calgary. Comparing for example,

performance eastbound in arrivals at Capreol/Sudbury: CN was "on time" 57%, 16 to 60 minutes late 15%, over 60 minutes late 25% and cancelled or did not operate 3% of the time; CP was on time 25%, 16 to 60 minutes late 24%, and over 60 minutes late 41% of the time.

The shorter scheduled operating time (72 hours) by CP is accompanied by a less reliable record of on-time performance than the CN service (84.8 hours).

Reliability or "on time" performance for all passengers services is part of the VIA contract with the railways, but the information is not readily available to the public or agencies such as Transport Canada.

PASSENGER RAIL EQUIPMENT

The existing passenger fleet consists of four basic kinds of equipment; unit passenger trains such as TURBO, self propelled coaches called Rail Diesel Cars (RDC's) which are operated individually or in groups, standard coaches and special purpose equipment primarily on the transcontinental service.

As of December 1976 CN operated 888 pieces of conventional rolling stock. This includes 205 vintage cars which are due for retirement. CP rail operated 187 pieces of conventional passenger car equipment of which 169 are stainless steel. All of this equipment is approximately now 25 years old.

The only unit train in operation is the Pratt and Whitney TURBO previously leased to CN. These two trainsets are 12 years old, providing up to 362 seats per train, of which 110 are first-class (one other trainset was destroyed in a 1979 fire).

There are 96 self-propelled cars available, 48 for each company, of stainless steel construction, on average 25 years old, and generally used on low density routes. There are 10 of these cars with a snack bar.

There are 260 coaches available in Canada, most of which are 25 years old. Most seat 76 passengers (19 rows of four seats each spaced 38" apart).

Since 1976, a limited number of the coaches have been undergoing a modernization with wall to wall carpeting and reclining seats, reducing the car capacity to 52 seats by eliminating 7 rows of seats and increasing the spacing to 58". VIA is continuing this program of conversion due to the popularity of the "Dayniter". In addition, several coaches have had 8 seats removed to permit the installation of shelves for a snack bar service.

Two hundred and sixty sleeping cars typically have 8 to 10 roomettes and 4 to 6 double bedrooms, and accommodate 24 people. Dome cars with elevated glass bubble observation decks represent another type. There are 41 dome cars, all of which are 25 years old, 17 of which have sleeping-car facilities.

The railways (CN & CP) owned 154 food service cars, from the traditional dining cars to swivel armchair club cars with airline food type distribution. One hundred and twenty-seven baggage cars, designed for passenger service, made up the balance of the special purpose fleet in 1976.

Exhibit 5-10 provides an inventory of rail passenger equipment as reported by Statistics Canada for December 31, 1976. Since that date, some of the CN and CP equipment has been retired and some has been retained for commuter rail services not operated by VIA. The rest has been incorporated into the VIA fleet. As of December 1978, CN and CP had retained 196 pieces of equipment. Algoma Central and the Ontario Northland each had a limited variety of equipment. Most of this equipment would be at least 25 years old.

EXHIBIT 5-1

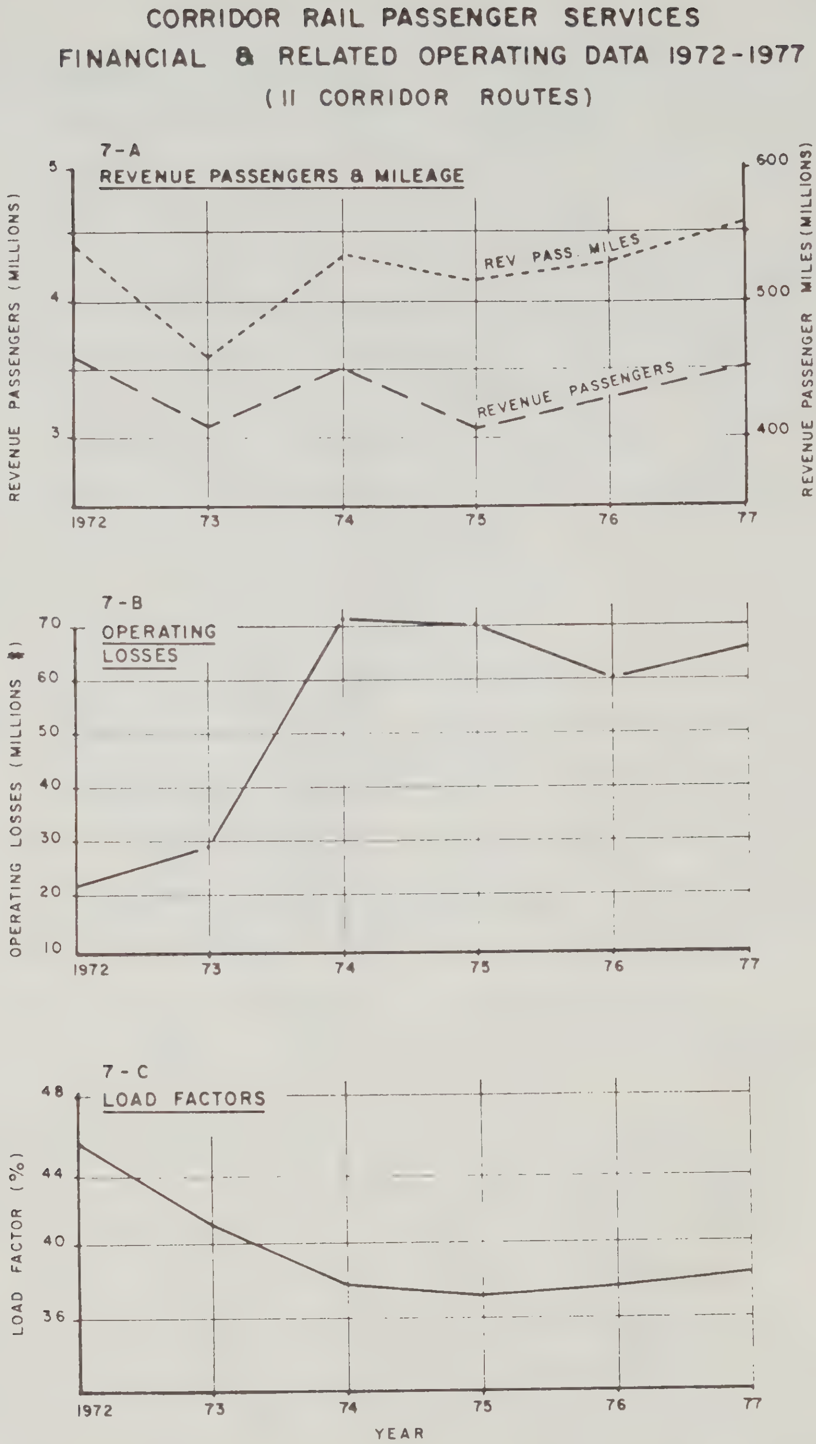

CORRIDOR RAIL PASSENGER SERVICES
FINANCIAL & RELATED OPERATING DATA 1972-1977
(11 CORRIDOR ROUTES)
7-A
REVENUE PASSENGERS & MILEAGE
REVENUE PASSENGERS (MILLIONS)
REVENUE PASSENGER MILES (MILLIONS)
REV. PASS. MILES
REVENUE PASSENGERS
5
4
3
600
500
400
1972
73
74
75
76
77
7-B
OPERATING LOSSES
OPERATING LOSSES (MILLIONS $)
70
60
50
40
30
20
10
7-C
LOAD FACTORS
LOAD FACTOR (%)
48
44
40
36
YEAR

EXHIBIT 5-2

FINANCIAL INVENTORY FOR SELECTED CORRIDORS
IN 1974

CORRIDOR	1974 FINANCIAL DATA ($'000's)			
	COSTS	REVENUE	LOSS	% REV/COSTS
TRANSCONTINENTAL	109,313	37,579	70,743	34.2
TORONTO/OTTAWA/MONTREAL	36,726	19,969	16,764	54.4
TORONTO/SARNIA/WINDSOR	21,405	8,953	12,451	41.8
TORONTO/TIMMINS/KAPUSKASING	3,459	1,195	2,263	34.5
TORONTO/NIAGARA FALLS/BUFFALO	2,400	635	1,764	26.5

SOURCE: A REPORT ON CANADIAN PASSENGER RAIL SERVICES
TRANSPORT CANADA, 1976

EXHIBIT 5-3

FINANCIAL INVENTORY FOR SELECTED CORRIDORS

In 1977

CORRIDOR	1977 FINANCIAL DATA ($,000's)			
	COSTS	REVENUE	LOSS	% REV/COST
Transcontinental	140,408	38,763	101,644	27.6
Toronto/Ottawa/Montreal	63,056	25,879	37,175	41.0
Toronto/Sarnia/Windsor	35,521	11,897	23,624	33.5
Toronto/Timmins/Kapuskasing	4,286	1,020	3,266	23.8
Toronto/Niagara Falls/Buffalo	3,308	588	2,720	17.8

SOURCE: STATEMENT OF REVENUES, COSTS AND ACTUAL LOSS ATTRIBUTABLE TO CARRYING OF PASSENGERS AND OTHER TRAFFIC, SECTION OF RAILWAY ACT 261, YEAR 1977, CANADIAN NATIONAL RAILWAYS AND CANADIAN PACIFIC RAILWAYS.

EXHIBIT 5-4

Northeastern Ontario Rail Service

Existing Financial Data (1978 Estimated)

Conventional Train Service	Cost	Revenue	Loss
CNR Toronto-North Bay & Cochrane-Kapuskasing	4,900,000	1,000,000	3,900,000
ONR North Bay-Cochrane	4,398,000	552,000	3,846,000
ONR Swastika-Noranda	735,000	11,000	724,000
	10,033,000	1,563,000	8,470,000
Northlander Train Service			
ONR Toronto-Timmins	5,001,000	900,000	4,101,000
All Trains	15,034,000	2,463,000	12,571,000

Share of Operating Loss

Conventional Train Service	Federal Subsidy	Provincial Subsidy	CNR Share	ONR Share	Total
CNR Toronto-North Bay & Cochrane-Kapuskasing	3,120,000		780,000		3,900,000
ONR North Bay-Cochrane	-	3,846,000	-	-	3,846,000
ONR Swastika-Noranda	579,000	-	-	145,000	724,000
	3,699,000	3,846,000	780,000	145,000	8,470,000
Northlander Train Service					
ONR Toronto-Timmins	900,000	3,201,000	-	-	4,101,000
Total	4,599,000	7,047,000	780,000	145,000	12,571,000

SOURCE: PASSENGER TRANSPORTATION NEEDS IN NORTHEASTERN ONTARIO, NORTHEASTERN ONTARIO MUNICIPALITIES ACTION GROUP

EXHIBIT 5-5

Northeastern Ontario Passenger Rail Services
Estimated Costs and Revenues 1980
(Millions)

Service	Cost	Revenue	Loss
Daily Overnight Toronto-Kapuskasing Northland (VIA)	9.42	1.78	7.69
Daily Daylight (TEE) Toronto-Timmins Northlander ONR	7.59	1.29	6.30
Weekender TEE (VIA) Toronto-North Bay	1.161	0.147	1.014
Moosonee Mixed	1.36	.163	1.197
Bus Connections	.254	.140	.240
TOTAL	19.831	3.392	16.439

SOURCE: NORTHEASTERN ONTARIO RAIL PROJECT

EXHIBIT 5-6

1977 Passenger Rail Services and Fuel Consumption

Selected Routes

SERVICE	NO. TRAINS PER YEAR	AVERAGE NO. SEATS	AVERAGE SPEED	NO. STOPS	ANNUAL FUEL CONSUMPTION GALL.	GALLONS PER SEAT MILE
TORONTO-MONTREAL 335 miles						
TURBO	305	322	79	2.5	223,250	.00663
RAPIDO	365	228	68	3	271,925	.00906
CAVALIER	365	137	41	10	127,563	.00950
BONAVENTURE	365	196	59	8	227,671	.00715
LAKESHORE	365	120	57	11	116,435	.00794
ALL TRAINS			62	5.7		.00792
TORONTO-OTTAWA 227 miles						
CAVALIER	308	60	38	6	84,084	.01643
EXECUTIVE	365	266	49	7	192,726	.00874
CAPITAL	365	245	47	9	160,600	.00791
ALL TRAINS			47	7.3		.00922
TORONTO-WINDSOR 223 miles						
TEMPO (ALL TRAINS)	365	289	55	5.6	141,032	.00600
OTTAWA-MONTREAL 116 miles						
RAPIDO (AVE)	365	211	52	1.8	52,511	.00588

SOURCE: INTERCITY PASSENGER TRANSPORT ENERGY EFFICIENCY: DATA BASE AND CASE STUDY, KHAN, 1979, ADAPTED

EXHIBIT 5-7

PASSENGER RAIL SERVICE

COMPARISON OF FUEL CONSUMPTION

1973 and 1977

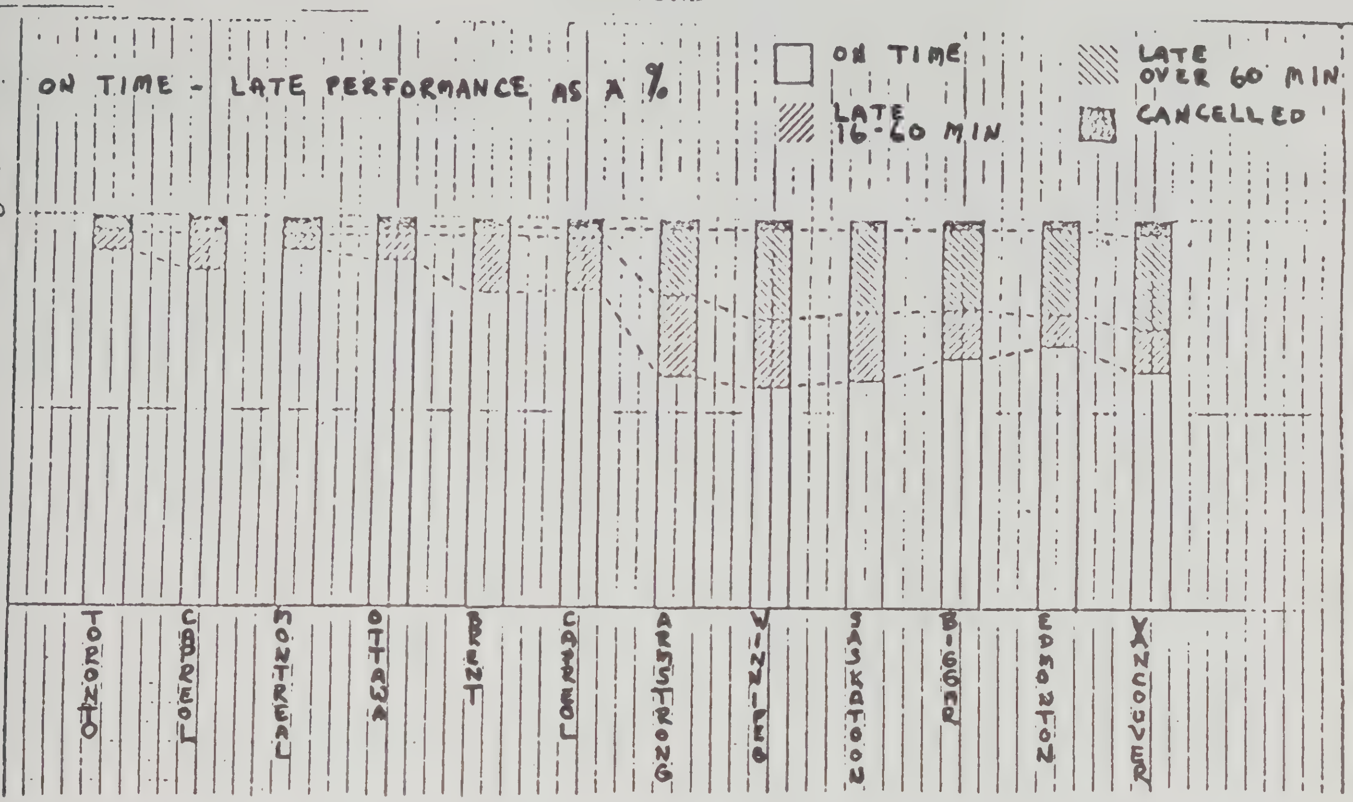
ROUTE	TRAIN	YEAR	NO. TRAINS	AVERAGE NO. SEATS	ANNUAL FUEL CONSUMPTION GALLONS	GALLONS PER SEAT MILE
TORONTO - MONTREAL	RAPIDO	1973	365	228	131,400	.00471
		1977	365	228	271,925	.00906
	CAVALIER	1973	365	326	160,420	.00471
		1977	365	196	227,671	.00950
TORONTO - OTTAWA	EXECUTIVE	1973	365	212	83,356	.00388
		1977	365	266	192,720	.00874
TORONTO - WINDSOR	TEMPO	1973	365	334	81,000	.00297
		1977	365	289	141,032	.00614

SOURCE: INTERCITY PASSENGER TRANSPORT ENERGY EFFICIENCY: DATA BASE AND CASE STUDY, KHAN, 1979, ADAPTED

EXHIBIT 5-8

CN - SUPERCONTINENTAL ON TIME PERFORMANCE RECORD 1975

WESTBOUND



EASTBOUND

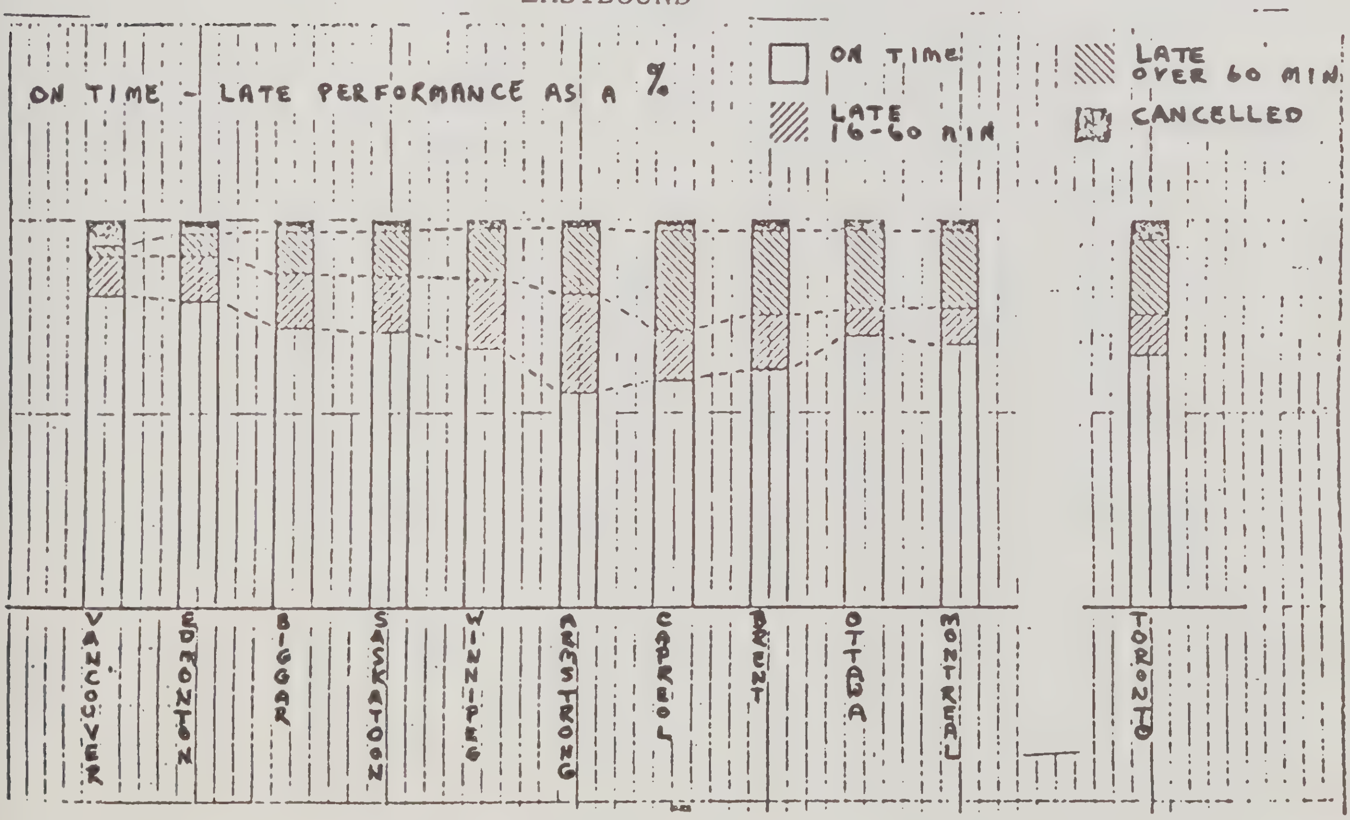
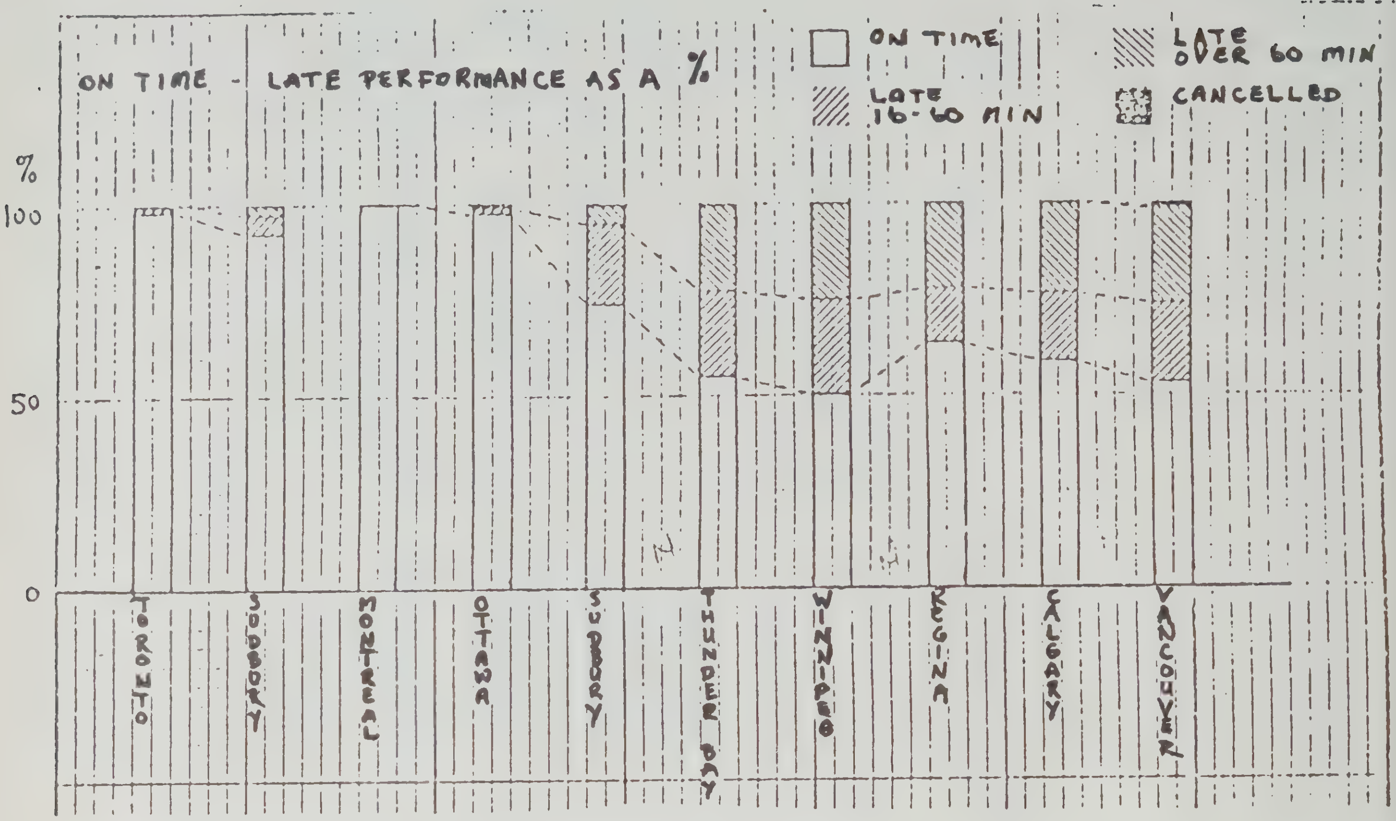


EXHIBIT 5-9

CP - CANADIAN ON TIME PERFORMANCE RECORD 1975

WESTBOUND



EASTBOUND

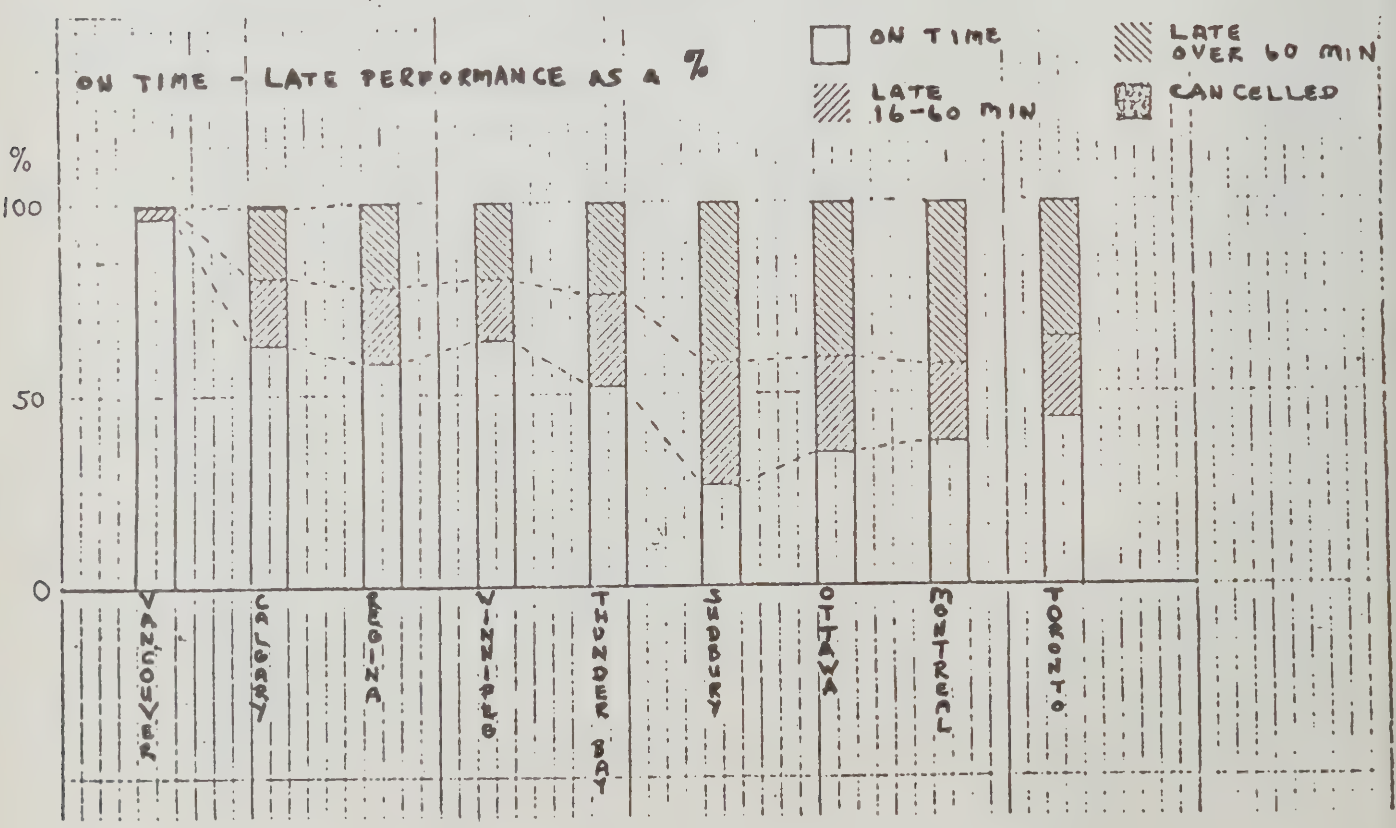


EXHIBIT 5-10

Passenger Rail

Equipment in Service at December 1976

	CANADIAN NATIONAL	CANADIAN PACIFIC	ALGOMA CENTRAL	ONTARIO NORTHLAND
Turbo				
Power Units	6			
Coach	15			
Parlour	6			
Self Propelled Cars	54	48		
Coaches	425	116	38	21
Combination (Pass. & Baggage)	20			1
Dining	58	18		2
Parlour	86	-		1
Sleeping	218	88		
Other (Pass. Carrying)	-		5	
Baggage	237			
Express & Mail Service	127	46	7	8
Total	1,248	316	50	33

6. Toronto Suburban Commuter Rail Usage

The suburban commuter rail services, instituted by the Province, have become a significant element of the urban transportation network in the Toronto area. Under the operating management of the Toronto Area Transit Operating Authority (TATOA) the services have gradually expanded in terms of both routes and service offered.

The usage is characterized by being highly centred on the downtown (Union Station). Virtually all trips have one end at this location. Ridership counts are therefore made by counting the passengers exiting from other stations in the system, as shown in Exhibit 6-1 for the 1968-1978 period. Exhibit 6-1 shows a continual growth in ridership at the locations most distant to the Toronto downtown while the stations close to the downtown have shown either no growth or a decline in ridership. This pattern is likely due to changes in the T.T.C. service (subway extensions), T.T.C. fare policy (zonal system to single fare) and more rapid population growth around the distant stations.

Exhibit 6-2 shows the passenger volumes by route section and train for each route and direction.

For service such as the Richmond Hill service, northbound (PM) ridership is less than the southbound (AM) ridership. There is also a significant peaking in the ridership by train in this service.

The northwest (Georgetown) service has a better balanced usage in the AM and PM than the Richmond Hill service due to the lack of other alternatives in this corridor. One train in each direction has low usage relative to the other three trains in each service period.

The Lakeshore service, between Pickering and Hamilton is the most extensive, operating both in the peak and off peak periods, including weekends. Passenger volumes are greater in the peak hours than in the previously mentioned corridors. The flows to Union Station from the west are larger than those from the eastern portion of the route.

Exhibit 6-3 shows the monthly passenger boardings from January 1968 to January 1980 and the percentage change. The data for the Lakeshore service shows August to be consistently the month with the highest usage, largely due to the usage of the GO system to attend the C.N.E. Every year, with the exception of those having labour disputes, has had some growth in ridership with the result that the average growth in the Lakeshore route between 1968 and 1979 has been 7.1% per annum.

Ridership on the Northwest service has a differing monthly variation, as shown in Exhibit 6-4 with August being one of the months with the lowest usage. Growth between 1975 and 1979 has averaged 11% per annum, however in each year the rate of growth has been less than in the previous year. This consistently declining rate of growth could suggest this corridor is approaching its practical potential usage.

The GO Bus ridership trends, for buses meeting the Lakeshore trains include passengers carried locally on these routes, especially between Hamilton and Burlington. The ridership has not shown any consistent trend from year to year.

Exhibit 6-6 has provided some estimates of average trip length. It appears over time that the average trip length has increased.

An approximation of the fuel efficiency for GO Rail services is provided in Exhibit 6-7. The figure represents a daily average. There would be considerable variation in the estimate by time of day (peak, off peak), route, direction and equipment type. TATOA had recently reported a decline in fuel productivity due to the introduction of the bi-level trains with two engines and the Richmond Hill service, which includes more deadhead than productive train miles. Therefore caution is needed in using the productivity figure. Efforts are continuing to improve the fuel productivity of the GO system.

The rail expenses of the GO Train service for 1978 are detailed in Exhibit 6-8. These are the expenses that are reported to the Rail Transport Committee of the C.T.C.

EXHIBIT 6-1

GO TRANSIT RAIL

AVERAGE WEEKDAY EXITS

STATION	1968	1970	1972	EXITS 1974	1976	1978	Oct. 1979
Hamilton	33	40	20	35	50	76	97
Burlington	51	71	50	98	147	231	348
Oakville West	26	53	75	103	108	173	212
Oakville*	872	1,011	1,250	1,739	2,129	2,725	2,760
Clarkson	805	1,052	1,314	1,794	2,254	2,514	2,815
Port Credit	1,114	1,376	1,641	1,781	1,955	1,967	2,419
Long Branch	837	749	741	701	739	774	758
Mimico	367	260	266	313	278	273	304
Danforth	178	188	275	429	280	301	365
Scarborough	746	561	546	566	449	404	484
Eglinton	1,156	1,215	1,293	1,162	1,099	1,105	1,362
Guildwood	793	936	1,113	1,078	1,078	1,122	1,172
Rouge Hill	280	379	532	535	622	744	936
Pickering*	994	1,109	1,210	1,588	2,047	2,364	2,350
Georgetown				198	288	362	416
Brampton				235	416	581	714
Bramalea				307	548	687	708
Malton				214	232	232	234
Etobicoke North					180	228	266
Weston				228	215	240	230
Bloor				115	146	207	165
Richmond Hill							275
Langstaff							170
Old Cummer							297
Oriole							306

*Does not include passengers to train feed bus service

EXHIBIT 6-2A

NORTH RAIL CORRIDOR

Passenger Volumes by Section and Train: Southbound A.M.

TRAIN #.	RICH.H.-LANG	LANG.-OL.CUM.	OL.CUM.-ORIOLE	ORIOLE-UN.
980	102	149	218	304
982	112	179	322	453
984	96	163	304	400

WEDNESDAY, 31 OCT. 1979
SOUTHBOUND A.M.

EXHIBIT 6-2B

NORTH RAIL CORRIDOR

Passenger Volumes by Section and Train: Northbound P.M.

TRAIN #	UN.-ORIOLE	ORIOLE-OL. CUM.	OL. CUM.-LANG.	LANG.-RICH. H.
985	265	199	127	78
987	430	308	189	117
989	347	234	129	80

WEDNESDAY, 31 OCTOBER, 1979

NORTHBOUND P.M.

EXHIBIT 6-2C

NORTHWEST RAIL CORRIDOR

Passenger Volumes by Section and Train: Eastbound A.M.

TRAIN #	GRGTWN.-BRPT.	BRPT.-BRA.	BRA.-MALT.	MALT.-ETOB.N.	ETOB.N.-WEST.	WEST.-BLOOR	BLOOR-UN.
990	53	146	248	265	278	295	269
992	94	290	512	571	617	660	614
994	158	417	672	737	825	853	800
996	138	325	503	545	621	668	635

WEDNESDAY, 31 Oct. 1979

EASTBOUND A.M.

EXHIBIT 6-2D

NORTHWEST RAIL CORRIDOR

Passenger Volumes by Section and Train: Westbound P.M.

TRAIN #	UN.-BLOOR	BLOOR-WEST.	WEST.-ETOB.N.	ETOB.N.-MALT.	MALT.-BRA.	BRA.-BRPT.	BRPT.-GRGTWN
991	741	749	729	690	652	415	164
993	666	703	672	617	547	323	104
995	640	669	603	509	454	267	110
997	234	244	222	189	175	119	38

WEDNESDAY, 31 OCT. 1979
WESTBOUND P.M.

EXHIBIT 6-2E
LAKESHORE CORRIDOR

Passenger Volumes by Section and Train: Eastbound

TRAIN NO.	H.-B.	B.-O.W.	O.W.-O.	O.-C.	C.-P.C.	P.C.-L.B.	L.B.-M.	M.-U.	U.-D.	D.-S.	S.-E.	E.-G.	G.-R.H.	R.H.-P.
902									20	7	9	12	19	18
946								2	8	14	16	16	14	14
948				14	30	83	91	94	7	11	10	13	14	14
904				139	245	369	384	383	20	20	19	21	21	29
950									6					6
952	25	96	156	562	815	1113	1199	1206						
906				470	1003	1452	1562	1575	34	43	43	43	45	44
958	142	504	684	1493				1493						
954				101	615	1037	1166	1192						
956				351	813	1039	1119	1132						
908				202	459	608	642	648	22	24	25	25	25	24
910				62	168	256	282	284	15	18	19	17	15	13
912				51	113	152	167	169	39	41	39	33	30	30
914				54	82	122	129	131	34	39	35	37	32	30
916				57	86	120	125	129	64	69	70	72	52	43
918				31	50	63	66	66	57	61	62	59	71	62
920				34	47	66	61	64	240	245	233	216	197	177
960									393	405	386	340	295	258
922				40	67	70	72	62	864	872	825	703	601	508
964									776	791	753	624	504	425
966								4	1122	1135	1065	876	680	568
924				63	79	90	94	92	1293	1297	1213	962	691	497
972				21				25	837	846	791	608	433	312
926				105	131	155	160	160	502	496	455	361	285	247
928				66	73	98	104	107	180	187	181	150	115	85
930				31	35	42	44	44	105	104	103	85	65	53
932				21	23	28	33	32	86	94	88	69	56	43
934				20	22	27	27	25	60	62	60	53	48	28
936				9	16	22	23	22	54	59	57	50	50	44
938				6	6	14	12	11	43	41	40	37	28	28

Wedensday, 31 Oct., 1979
Eastbound

EXHIBIT 6-2F

LAKESHORE CORRIDOR

Passenger Volumes by Section and Train: Westbound

TRAIN NO.	P.-R.H.	R.H.-G.	G.-E.	E.-S.	S.-D.	D.-U.	U.-M.	M.-L.B.	L.B.-P.C.	P.C.-C.	C.-O.	O.-O.W.	O.W.-B.	B.-H.
903	81	97	117	130	141	128	21	22	15	17	27			
949	279	344	434	533	596	585	33	26	23	27	30			
905	428	525	760	886	918	912	13	9	14	14	10			
953	562	694	899	1099	1141	1117								
955	548	709	946	1191	1279	1280	1							
907	603	799	1058	1316	1405	1400	42	39	40	35	25			
961	277	348	538	672	728	720								
909	169	225	250	270	281	279	26	29	28	29	26			
911	178	182	198	204	210	212	31	30	31	27	19			
913	150	160	163	170	172	160	67	70	68	40	27			
915	70	79	91	100	104	100	97	97	95	67	49			
917	69	71	76	77	78	68	97	100	98	71	48			
919	69	71	80	80	83	74	182	182	180	125	71			
921	53	57	63	67	68	70	556	553	534	403	274			
965							963	960	912	702	460			
923	58	60	63	69	71	67	1534	1520	1413	1051	617			
967	31					31	1473	1464	1375	1023	753			
963							934				934	591	398	85
969							1097	1065	962	553	87			
925	39	49	56	57	55	43	780	761	701	493	246			
971	17	20	21	18	18	18	412	407	374	275	148	64	45	12
973	18	24	26	29	27	29	265	260	238	179	92			
927	16	21	21	22	21	18	268	272	262	205	86			
975	32	32	32	32	31	29								
929	21	22	31	32	33	31	278	275	264	199	94			
931	8	8	9	9	10	6	173	177	168	131	74			
933	8	13	15	14	17	10	221	219	207	158	81			
935	6	2	4	6	8	6	262	263	253	211	78			
937	3	6	6	4	4	3	130	129	121	89	70			
939	28	25	24	22	22	20	48	47	48	34	22			

EXHIBIT 6-3

GO TRANSIT

LAKESHORE CORRIDOR

Boardings by Month and Year - January 1968 - January 1980

MONTH YEAR MONTH	1967	1968	1969	% CHANGE	1970	% CHANGE	1971	% CHANGE
JANUARY		393,700	390,800	-0.7%	381,687	-2.3%	422,528	+10.7%
FEBRUARY		368,100	357,300	-2.9%	367,061	-2.7%	416,981	+13.6%
MARCH		397,000	408,700	+2.9%	410,204	+0.4%	490,604	+19.6%
APRIL		365,300	372,700	+2.0%	397,645	+6.7%	397,666	0.0
MAY		366,500	370,300	+1.0%	368,645	-0.4%	399,242	+ 8.3%
JUNE		336,000	366,200	+0.1%	402,601	+9.9%	439,238	+ 9.1%
JULY		348,300	372,200	+6.9%	391,892	+5.3%	408,743	+ 4.3%
AUGUST		532,700	570,800	+7.1%	519,042	-9.0%	588,075	+13.3%
SEPTEMBER		364,000	386,700	+6.2%	502,506	+29.9%	529,641	+ 5.4%
OCTOBER		387,500	414,200	+6.9%	420,675	+1.6%	432,875	+ 2.9%
NOVEMBER		424,900	414,900	-2.3%	437,931	+5.5%	483,914	+10.5%
DECEMBER		384,800	419,100	+8.9%	456,540	+8.9%	456,544	0.0
AVERAGE		389,100	403,700		421,320		455,504	
YEAR'S TOTAL	2,519,578	4,668,800	4,843,900	+3.7%	5,055,834	+4.4%	5,466,051	+ 8.1%
CUMULATIVE TOTAL	2,519,578	7,188,378	1,857,178		16,701,078		22,167,129	

EXHIBIT 6-3 (CONTINUED)

GO TRANSIT

LAKESHORE CORRIDOR

Boardings by Month and Year - January 1968 - January 1980

YEAR / MONTH	1972	% CHANGE	1973	% CHANGE	1974	% CHANGE	1975	% CHANGE	1976	% CHANGE
JANUARY	436,189	+ 3.2	519,637	+19.1	538,791	+ 3.7	474,572	-11.9	631,968	+33.2
FEBRUARY	440,071	+ 5.5	467,289	+ 6.2	485,127	+ 3.8	486,208	+ 0.2	570,090	+17.2
MARCH	533,567	+ 8.8	531,495	- 0.4	539,686	+ 1.5	544,878	+ 1.0	677,322	+24.3
APRIL	456,453	+14.8	457,524	+ 0.2	499,073	+ 9.1	571,812	+14.6	596,325	+ 4.3
MAY	482,515	+20.9	484,568	- 0.4	518,932	+ 7.1	546,184	+ 5.3	575,043	+ 5.3
JUNE	487,489	+11.0	469,945	- 3.4	501,251	+ 6.1	552,907	+10.3	632,348	+14.4
JULY	453,915	+11.1	439,681	- 3.1	532,834	+ 21.2	593,354	+11.4	594,934	0.0
AUGUST	752,869	+28.0	234,498	-68.9*	954,041	+306.8	975,232	+ 2.1	1,014,125	+ 4.0
SEPTEMBER	555,985	+ 5.0	414,436	-25.5*	584,980	+ 41.2	586,110	+ 0.2	821,578	+40.2
OCTOBER	501,048	+15.7	510,682	+ 1.9	581,647	+ 13.9	626,825	+ 7.8	630,556	+ 0.6
NOVEMBER	551,135	+13.9	554,227	+ 1.0	583,819	+ 5.3	610,557	+ 4.6	710,557	+16.4
DECEMBER	504,432	+10.5	474,874	- 5.9	514,261	+ 8.3	615,726	+19.7	638,541	+ 3.7
AVERAGE	513,056		463,238		569,536		598,697		674,449	
YEARS TOTAL	6,156,668	+12.6	5,558,856	- 9.7	6,834,442	+ 22.9	7,184,365	+ 5.1	8,093,387	+12.7
CUMULATIVE TOTAL	28,323,797		33,882,653		40,717,095		47,901,460		55,994,847	

* Strike in August & Sept. by CN

* TTC & Gray Coach strike during CNE

EXHIBIT 6-3 (CONTINUED)

GO TRANSIT

LAKESHORE CORRIDOR

Boardings by Month and Year - January 1968 - January 1980

MONTH / YEAR	1977	% CHANGE	1978	% CHANGE	1979	% CHANGE	1980	% CHANGE
JANUARY	630,317	- 0.3	707,062	+12.2	749,486	+ 6.0	798,037	+ 6.5
FEBRUARY	617,128	+ 8.3	652,268	+ 5.7	691,510	+ 6.0		
MARCH	714,980	+ 5.6	790,076	+10,5	829,580	+ 5.0		
APRIL	640,321	+ 7.4	676,652	+ 5.7	741,016	+ 9.5		
MAY	676,194	+17.6	731,158	+ 8.1	779,996	+ 6.7		
JUNE	755,769	+10.5	816,230	+ 8.0	786,201	- 3.7		
JULY	698,358	+17.44	754,227	+ 8.0	756,040	+ 0.2		
AUGUST	1,095,020	+ 8.0	1,311,280	+19.7	1,284,631	- 2.0		
SEPTEMBER	880,499	+ 7.2	972,134	+10.4	918,232	- 5.5		
OCTOBER	671,512	+ 6.5	718,518	+ 7.0	829,185	+15.4		
NOVEMBER	742,591	+ 4.5	794,572	+ 7.0	837,927	+ 5.4		
DECEMBER	645,554	+ 1.1	684,287	+ 6.0	694,359	+ 1.5		
AVERAGE	730,687	+ 8.3	800,705	+ 9.6	824,847	+ 3.0		
YEARS TOTAL	8,768,243	+ 8.3	9,608,464	+ 9.6	9,898,163	+ 3.0		
CUMULATIVE TOTAL	64,763,090							

EXHIBIT 6-4

TORONTO AREA TRANSIT OPERATING AUTHORITY NORTH WEST RIDERSHIP

YEAR	1974	1975	% CHANGE	1976	% CHANGE	1977	% CHANGE	1978	% CHANGE	1979	% CHANGE	1980	% CHANGE
January		53,628	-	81,008	+ 51.1	88,046	+ 8.7	105,129	+ 19.4	105,094		115,478	+ 9.9
February		56,358	-	73,855	+ 31.1	88,419	+19.7	97,558	+ 10.3	95,860	- 1.7		
March		57,783	-	85,072	+ 47.2	97,286	+14.4	103,277	+ 6.2	104,456	+ 1.1		
April		63,455	-	74,245	+ 17.6	81,615	+ 9.9	91,806	+ 12.5	90,756	- 0.9		
May	35,998	63,223	+ 75.6	74,484	+ 17.8	86,695	+16.4	98,605	+ 13.7	100,122	+ 1.5		
June	37,352	62,855	+ 68.3	80,021	+ 27.3	88,591	+10.7	96,580	+ 9.0	97,512	+ 1.0		
July	40,113	62,929	+ 56.9	66,721	+ 6.0	74,670	+11.9	80,644	+ 8.0	89,066	+11.4		
August	70,415	54,800	- 22.2	73,206	+ 33.5	83,448	+14.0	83,455	+ 6.0	90,530	+ 2.3		
September	51,739	70,551	+ 36.4	82,932	+ 17.5	89,850	+ 8.3	115,250	+ 28.3	88,892	-22.9		
October	54,732	74,678	+ 36.4	81,352	+ 24.6	90,765	+11.6	100,023	+ 10.2	105,083	+ 5.1		
November	54,056	72,182	+ 33.5	92,803	+ 28.6	100,084	+ 7.8	97,580	- 2.5	108,560	+11.3		
December	47,431	73,847	+ 55.7	81,927	+ 10.9	85,185	+ 4.0	70,440	- 17.3	83,107	+18.0		
AVERAGE	48,995	63,857	+ 30.3	78,969	+ 23.7	87,888	+11.3	95,445	+ 8.6	96,653	+ 1.3		
YEAR"S TOTAL	391,957	766,289	+ 95.5	947,626	+ 23.7	1,054,654	+11.3	1,145,347	+ 8.6	1,159,838	+ 1.3		
CUMULATIVE TOTAL	391,957	1,158,246		2,105,872		3,160,526		4,305,873		5465,711			

EXHIBIT 6-5

GO BUS RIDERSHIP TRENDS

ANNUAL RIDERSHIP COUNTS

1. Hamilton/Oakville Train Meet

   1975 - 500,515
   1976 - 557,483 (+11.4%)
   1977 - 585,617 (+5.0%)
   1978 - 529,971 (-9.5%)
   1979 - 589,332 (+11.2%)

2. Oshawa/Pickering Train Meet

   1975 - 601,944
   1976 - 658,453 (+9.4%)
   1977 - 680,962 (+3.4%)
   1978 - 671,895 (-1.4%)
   1979 - 703,771 (+4.7%)

EXHIBIT 6-6

Average Trip Length and Passenger Mile Trend

For selected years an estimate has been made of the average trip length on each rail corridor and daily passenger miles.

Year	Corridor	Passenger Miles	Average Trip Length (Miles
1968	Lakeshore West	120,806	14.7
	Lakeshore East	109,932	13.3
1974	Lakeshore West	211,609	16.1
	Lakeshore East	150,030	14.0
	Northwest	43,612	19.9
1979	Lakeshore West	332,724	17.1
	Lakeshore East	233,647	17.5
	Northwest	97,831	17.9
	North	33,063	15.8

For the year 1979 average trip length and passenger mile trend was calculated using another more accurate procedure and the results are similar:

Lakeshore West	347,435	17.5
Lakeshore East	242,313	16.0
Northwest	93,294	17.8
North	34,797	16.0

The first procedure makes several assumptions that could effect the overall results:

a) All passengers are assumed to travel to or from Union Station and the boarding or exiting station. (At least 95% of passengers do in fact do this.)

b) No consideration was made of passengers transferring to GO Bus at either Oakville and Pickering. This would have the greatest impact on the Lakeshore East and should increase the average trip length slightly if considered.

The impact of the assumptions appears to have been small for 1979.

In summary, trip length has increased on both the Lakeshore East and West rail corridors.

This has resulted from the following:

a) Growth has been concentrated at station outside of Metro.

b) Elimination of zone fares on TTC has decreased or held constant boardings at stations within Metro.

EXHIBIT 6-7

Passenger Miles Per Gallon Estimate

Derived

Determine annual mileage on GO Train taking into consideration variation in service by day of week, holidays, etc.

= 804,000 train miles.

Divide into Annual Consumption of 4.48 million gallons

= 5.57 gallons per train mile.

Average weekday mileage

= 250 miles per day

Daily consumption is 2501 x 5.57 = 13,936 gallons per day.

Total passenger miles per day on rail system taken from TARMS work

= 717,839.

Passenger miles per gallon

$$= \frac{717.839}{13.936}$$

= 51.5

EXHIBIT 6-8

Schedule 17, She
(classes II, III and

Railway Government of Ontario Transit Year 19 78

RAIL EXPENSES

	Total Expense $
I. ROAD MAINTENANCE	
2201 Superintendence	
2202 Maintaining roadway and track	
2203 Maintaining track structures	
2204 Maintaining ancillary structures	
2209 Road property depreciation	649,011
2210 Injuries to persons	
2211 Other roadway and structure expense	923,364
2212 Maintaining joint facilities – Dr.	1,047,423
2213 Maintaining joint facilities – Cr.	
Total road maintenance	2,619,798
II. EQUIPMENT MAINTENANCE	
2221 Superintendence	725,824
2222 Shop and power plant machinery	
2223 Other equipment and machinery – depreciation	
2225 Locomotives	1,580,149
2226 Cars	3,798,436
2227 Vessels	
2228 Work equipment	
2229 Other equipment	
2236 Rolling stock and vessels – depreciation	4,363,868
2237 Injuries to persons	
2238 Other equipment expenses	199,443
2239 Maintaining joint equipment – Dr.	
2240 Maintaining joint equipment – Cr.	
Total equipment maintenance	10,667,720
III. TRAFFIC	
2251 Superintendence	
2252 Agencies	
2253 Other traffic expenses	
Total traffic	
IV. TRANSPORTATION – RAILWAY LINE	
2261 Superintendence	
2261½ Dispatching	160,259
2262 Station employees	1,823,009
2262½ Other station service	82,913

INSTRUCTIONS

Supply on this schedule details of expenses to agree with rail expenses as reported on schedule 14.

5-3509-40.17(s): 9-9-74

EXHIBIT 6-8 (CONTINUED)

Schedule 17, Shee
(classes II, III and

Railway Government of Ontario Transit Year 19 78

RAIL EXPENSES – Continued

	Total Expense $
IV. TRANSPORTATION – RAILWAY LINE – Concluded	
2263 Yard enginemen	
2264 Other yard employees	
2265 Yard locomotive fuel and power	
2267 Other yard expenses	
2268 Operating joint yards and terminals – Dr.	
2269 Operating joint yards and terminals – Cr.	
2270 Train enginemen	3,122,809
2271 Train locomotive fuel and power	2,060,562
2273 Other train locomotive expenses	
2274 Trainmen	
2275 Other train expenses	
2277 Injuries to persons	
2278 Loss and damage	
2279 Other casualty expenses	132,185
2280 Other rail transportation expenses	411,548
2281 Operating joint facilities – Dr.	
2282 Operating joint facilities – Cr.	
Total transportation – railway line	7,793,285
V. MISCELLANEOUS RAILWAY OPERATIONS	
2288 Miscellaneous operations	
2289 Operating joint miscellaneous facilities – Dr.	
2290 Operating joint miscellaneous facilities – Cr.	
Total miscellaneous railway operations	
VI. GENERAL	
2291 Administration	1,962,126
2292 Pensions	
2294 Other general expenses	580,739
2295 General joint facilities – Dr.	
2296 General joint facilities – Cr.	
Total general	2,542,865
VII. EQUIPMENT RENTS	
2297 Rent for equipment – Dr.	
2298 Rent from equipment – Cr.	
Net equipment rents	
VIII. JOINT FACILITY RENTS	
2299 Joint facility rents – Dr. (s. 18)	2,000,294
2300 Joint facility rent income – Cr. (s. 18a)	2,000,294
Net joint facility rents	

INSTRUCTIONS

Supply on this schedule details of expenses to agree with rail expenses as reported on schedule 14.

5-3509-10.17(s): 9-9-74

EXHIBIT 6-8 (CONTINUED)

Schedule 17, She
(classes II, III and

Railway Government of Ontario Transit Year 197

RAIL EXPENSES – Concluded

	Total Expense $
IX. RAILWAY TAX ACCRUALS	
2301 Provision for income taxes – railway (s. 19)	96,416
2302 Other railway taxes(s. 19)	
Total railway tax accruals	96,416
Total railway expenses	
X. EXPRESS OPERATIONS	
2303 Express operation expenses (s. 42 & 45)	
2304 Provision for income taxes – express (s. 42 & 45)	
2305 Other express taxes (s. 42 & 45)	
Total express operations	
XI. COMMERCIAL COMMUNICATIONS OPERATIONS	
2306 Communications expenses (s. 53 & 55)	
2307 Provision for income taxes – communications (s. 53)	
2308 Other communications taxes (s. 53)	
Total commercial communications operations	
XII. HIGHWAY TRANSPORT (RAIL) OPERATIONS	
2309 Highway transport (rail) expenses (s. 62 & 65)	
2310 Provision for income taxes – highway transport (rail) (s. 62)	
2311 Other highway transport (rail) taxes (s. 62)	
Total highway transport (rail) operations	
RECAPITULATION OF EXPENSES	
I. Road maintenance	2,619,798
II. Equipment maintenance	10,667,720
III. Traffic	
IV. Transportation – railway line	7,793,285
V. Miscellaneous railway operations	
VI. General	2,542,865
VII. Equipment rents	
VIII. Joint facility rents	2,000,294
IX. Railway tax accruals	96,416
Total railway expenses	
X. Express operations	–
XI. Commercial communications operations	
XII. Highway transport (rail) operations	
Total rail expenses	25,720,378

INSTRUCTIONS

Supply on this schedule details of expenses to agree with rail expenses as reported on schedule 14.

5-3509-40.17(s): 9-9-74

7. Summary

The purpose of this report is to provide an overview of rail passenger usage in Ontario. It also provides an assessment of both the quantity and quality of rail passenger information currently available.

Based on the overview, the following points are evident:

1. There is a lack of a coordinated information base.

   Information is collected by a variety of agencies, for a variety of reasons, and usually with no continuity. Therefore, the data tends to be partial, discontinuous or inconsistent. Significant improvements to the information base could be made if the various data needs were coordinated.

2. Much of the rail information is dated.

   With the review of Canada's passenger rail services in the mid-seventies came a significant pool of information, on ridership, service levels, fleet composition etc. But there has not been an update of that information, particularily since responsibility for the passenger rail services was assumed by VIA Rail Inc. Regular statistical reports, similar to those published for the aviation sector by Statistics Canada would partially alleviate this shortcoming.

3. There is a lack of information concerning future usage.

   In the information review process no source was identified as responsible for forecasting the future requirements of passenger rail services in Ontario. Similar forecasts, as part of a basic planning and policy making capability exist for an aviation system (Transport Canada) or a highway system (M.T.C.). The lack of a sound forecasting base would adversly affect several areas including the financial planning, service planning and dealings with other organizations. Ontario may consider the development of some expertise to assess future requirements in order to provide itself with a sound basis for future discussions.

Potentially some of these deficiencies will be rectified once VIA Rail has fully established itself. However, there is no assurance that the Province will be given ready access to VIA's information base once it is established.

RAILWAYS AND THE PHYSICALLY DISABLED

Introduction

In discussing the matter of railways and the physically disabled, it is important first to recognize that there are two distinct types of rail service operated in the Province. They are passenger rail services and commuter rail services, each of which exhibit different operational characteristics.

Passenger rail services are typically provided between urban centres, over long distances, having relatively low demands, a small number of scheduled trips per day, and covering a very large catchment area. In addition to VIA, these services are operated in Ontario by Algoma Central, a private company which receives federal subsidies and operates under federal jurisdiction, and Ontario Northland, a provincial agency which operates services at the provincial prerogative with provincial funding.

Commuter rail services, on the other hand, are typified by relatively short distances within an urbanized commutershed, high frequencies, high volumes and short station dwell times. They exist within the greater Toronto area and are administered by the Toronto Area Transit Operating Authority; at present the service itself is operated under contract with Canadian National Railways and in compliance with federal requirements. The services are provincially funded and again are operated at provincial prerogative.

Q1) What problems have been identified with respect to railways and the physically handicapped (particularly in Ontario)?

A1) While the two services share certain mutual problems related to greater accessibility for the physically disabled, there are also some quite separate aspects to be considered due to the different operating features, for instance:

- the design of the equipment varies. The passenger rail is oriented toward maximum comfort for long journeys, whereas the commuter coaches, out of necessity, are built to maximize carrying capacities (bi-levels for example). This fact is important when one considers the matter of accommodating wheelchair-bound patrons.

- the volumes carried are significantly different. The peak loads associated with commuter service raise issues of safety and impact on schedule adherence with regard to the physically disabled's access to and egress from the train.

- commuter track and platform usage is often revised at short notice due to various operational situations. This invariably necessitates rapid development of waiting passenger to alternate platforms on the opposite side of the tracks.

- the numbers of station and train staff are small and this would limit, in particular, the abilities of employees on commuter operations to provide assistance to the physically disabled.

On a more general level, the problems identified include:

- access to and egress from the rail facility, either by public transportation, specialized services, private car, etc., is not universally available. This presumably would be beyond the responsibility of the rail carrier.

- accessibility within terminals and to platforms is often poor.....steps, doorways, counter levels, turnstiles, lighting, etc. This would require architectural solutions, the degree of which would be dependent on each situation.

- lifting devices for boarding and alighting from the train are not provided. While this could be provided on board or on platform, it involves some complications in regard to passenger location and coach location at the platform.

- on board mobility is poor......isle widths, accessibility to washrooms, food services, sleeping accommodation. This would require equipment modificiations, which would be significant.

- wheelchair tie-down devices are not provided. While this could be accommodated with interior design modifications, the general safety of the disabled in the event of accidents and other occurrences will require further consideration.

Q2) Identify any steps that have been taken by government, railways or the public, to alleviate some of these problems.

A2) A number of steps have been taken by Federal and Provincial levels of Government as well as the railways in attempting to address the needs of the physically disabled.

In the case of VIA services, the Federal Government, through the Canadian Transport Commission, directed VIA to provide manual lifting for physically disabled patrons at thirteen stations across Canada within a period of three months from 24th April 1980. The stations identified in Ontario are Ottawa, London, Windsor and Toronto.

VIA intends to modify some rail diesel cars to facilitate travel by the disabled and have indicated that they will have a reasonable degree of accessibility on all services by the mid 1980's. The cars will be fitted with lifts on both sides and will have a modified interior to provide for the safe transport of the disabled. It is anticipated of course that VIA will receive federal financial support in these undertakings.

As none of these measures have been implemented to date, their effectiveness cannot be determined at this time.

Ontario Northland reports that whereas there is no formal written policy regarding the carriage of the disabled, to its knowledge no train crew has refused to assist a disabled individual in boarding. To date, the transportation of the disabled on ONTC passenger rail services has been accommodated within the physical constraints of the design of its equipment, and the disabled community has not registered any complaints with regard to the services provided.

On GO Transit Rail services, the following conditions apply and are stated in the tariff booklet:

1(h) Blind Persons - Where a passenger who is a member of the Canadian National Institute for the Blind or presents satisfactory proof acceptable to the Authority that he is blind and is accompanied by a sighted attendant, the blind passenger and the attendant shall pay one adult single fare only for their transportation and travel on a party ticket.

1(h) (cont'd)

If the blind passenger is accompanied by a "Seeing Eye" dog and sighted escort, the blind person and "Seeing Eye" dog will be carried on one ticket. The sighted person, however, must purchase another ticket.

1(i) Disabled Persons - Where a passenger who presents proof satisfactory to the Authority that he is disabled and is accompanied by an attendant, the disabled passenger and the attendant shall pay one adult single fare only for their transportation but a wheelchair or other remedial conveyance of the disabled passenger shall not be transported unless space is available.

8(e) Assistance to Passengers - The Authority does not provide assistance for those who are incapable of taking care of themselves and or being unable to board or alight from a bus or train without assistance. These passengers must be accompanied by an attendant capable of aiding such passengers on and off the bus or train without additional assistance.

The Ministry of Transportation and Communications and the Toronto Area Transit Operating Authority are currently undertaking a preliminary study to determine an appropriate approach towards addressing the interregional mobility needs of the disabled within the TATOA area. This project will evaluate the opportunities both for accessibility improvements to existing services as well as the provision of alternate specialized bus transportation services. While it is premature to judge the outcome of this review, the early indications are that the provision of full accessibility to the GO Rail system would be an extremely expensive and operationally undesirable undertaking in view of the characteristics of the service and its infrastructure. Results of the study should be available in September 1980.

Q3) How have other authorities (Canadian, American, etc.) addressed the problem of accessibility to the rail system for the handicapped?

A3) In the United States of America the approach has been to mandate accessibility to "key stations" of rapid, light and commuter rail operations key stations being those at major activity centres having 15% higher than average station ridership, or end of line stations. These key stations would be accessed by specialized services and modifications are to be accomplished over a 50 year time frame.

A3) (cont'd)

In Britain and Norway steps have been taken to improve train accessibility including the installation of lifting devices to aid the disabled in boarding trains.

Little information is available to indicate the success or failure of these attempts, or the degree of use of these features.

Q4) What steps can the Province of Ontario take in providing greater accessibility to the Railway system for the handicapped?

A4) As indicated earlier, the Province of Ontario is studying how best to meet the mobility needs of the physically disabled within the TATOA area. Since 1976, with the development of a pilot project on transportation for the disabled in urban areas, MTC has implemented a funding policy on urban transportation for the disabled, initiated the GO Study on mobility and has started discussions with the Ontario Bus industry to how the mobility needs of the disabled can be addressed in interurban bus travel.

From our experience to date, it is evident that between modes and even within modes, there is a wide diversity of trip lengths, frequencies, volumes, operational and cost considerations which suggests that 'universal solutions' are not appropriate. It is recommended, therefore, that any policy which is proposed by Ontario regarding rail services should recognize that there are variances in operations and conditions, and should permit flexibility in approach in order that the mobility needs of the disabled throughout the Province can be addressed in the most effective manner for each individual service.

THE CHARACTERISTIC ROUTING OF RAIL FREIGHT CARS

THE TASK FORCE ON RAIL POLICY FOR THE PROVINCE OF ONTARIO

Canadian Pacific
Consulting Services Ltd.

A PAPER CONCERNING THE CHARACTERISTIC ROUTING OF RAIL FREIGHT CARS

PREPARED FOR THE
TASK FORCE ON RAIL POLICY
FOR THE
PROVINCE OF ONTARIO

BY
CANADIAN PACIFIC CONSULTING SERVICES LTD.

JUNE 3, 1980

TERMS OF REFERENCE

"Demonstrate the characteristic routing of rail freight cars; e.g. in fast block trains between gateways and major yards, in transfers to intermediate yards, then final distribution to local centers and wayside spurs."

INDEX

1. BACKGROUND

Before discussing the characteristic routing of rail freight cars throughout Ontario, it is necessary to provide some background information about rail mode characteristics for complete understanding and insight into why rail freight moves the way it does. For example, those who are not fully familiar with rail freight operations may find it unusual that in the rail freight business the shortest rail distance between two points is not necessarily the straightest rail line between the two points.

1.1 STANDARDIZATION

The United States and Canada by the turn of the century established basic standards for the railway industry so that there could be a free and uninhibited interchange of railway rolling stock throughout the continent. This meant standardizing the track gauges, the coupling mechanisms, the braking apparatus and all pertinent features of rolling stock. This standardization still persists and as a result a car loaded with watermelons in Mexico can be shipped to Edmonton, Alberta; the car then can be loaded with another cargo for Fairbanks, Alaska, move via Vancouver and thence rail ferry to Alaska; next travel to Seattle and finally return to Mexico. At every point in the trip, the handling railway has the spare parts necessary to keep the car in working order.

Similar standardization was not done within Europe, there being different gauges between Spain, France/Britain/Germany and Russia. As well, the coupling and brake mechanisms are not compatible, which results in a delay and cost for transshipment of goods where the diverse systems come together. The European Community is today struggling with the need to standardize. India and Australia also have a diversity of rail standards that create difficulties.

It should be noted that there are two non standard guage railways in Canada, the White Pass and Yukon in the Yukon and the Newfoundland

lines of Canadian National. However, through the use of containers on both railways and cars that allow for the changing of wheels in the case of the Newfoundland line the effect has been minimized.

1.2 RAILWAY REGULATION

Within Canada, railways early in their development were placed under federal jurisdiction so that individual political areas could not put impediments in the way of free interchange and subsequent flow of trade and commerce. The regulation of railways is the responsibility of the Canadian Transport Commission.

1.3 CONSTRUCTION OF RAILWAYS

Within Ontario and of course, other locations, the building and development of rail lines stemmed from their reliability vis a vis other modes of transportation and their inherent energy efficiency since the resistance to motion of a steel wheel on a steel rail is less than for any other type of overland transport.

However, the construction and equipping of the railways was capital-intensive and the decision as to where a line was to be located was usually the result of determining where the cheapest route could be built (but not necessarily the cheapest route to operate) and the desire of the financial backers to locate the line where immediate gains could be made. The presence or absence of a rail link either enhanced or detracted from the development of towns in the settled parts of the country and, as well, dictated the development of towns in the unsettled portions of Canada.

Since there was no central plan covering the building of railways in Ontario, nor in other parts of North America, and since the economic basis on which the decision to build the original lines have often changed, the resulting railway network contains some redundent lines and a wide variance in the quality of the lines both due to the initial type of the construction and in ongoing maintenance. Also the rail routes have a

degree of permancy in their location that makes it difficult and expensive in the extreme to relocate them, especially in the larger metropolitan areas.

Within Ontario during the last two decades, there have been only a few new rail lines constructed. Two lines were constructed to serve new mines: at Bruce Lake in Northwestern Ontario by Canadian National and at Kidd by the Ontario Northland. Also a new line was built in the Nanticoke area to serve the steel complex being developed there. And, there has been major construction by most Ontario railways in the period to provide improvements to existing lines.

There are no known plans by Ontario railways to build new lines. As to future development, it is always hazardous to establish firm guidelines but if one was to estimate what traffic volume would warrant the construction of a new line of 10 to 20 miles, the suggested number would be an annual volume of some 1 million tons for a 20-year period. Smaller volumes would be a better candidate for other land transport modes.

1.4 ONTARIO RAILWAYS

Throughout Ontario at the turn of the century, a great many rail lines were sponsored by separate companies, mostly to serve only local requirements. Over time, these lines, for the most part, were amalgamated into the major transcontinental systems, often as branch lines of the large systems.

The larger companies did construct main lines with the idea that these would be high-capacity rail routes carrying both local and through freight. United States railways established through-rail routes between the Detroit and St. Clair Rivers and the Niagara River, as these served as a short-cut and a more economic route for American freight moving between Michigan and New York State as compared with moving within the United States around the south shore of Lake Erie. These routes are still used by the Chesapeake and Ohio, the Norfolk and Western and ConRail.

The Canadian National (Grand Trunk) established its lines between Sarnia and Windsor through London, Toronto and eastward to Montreal. Canadian Pacific established its main line between Windsor, London, Toronto and eastward to Montreal. Both of these rail carriers also established lines between Toronto and the Sudbury-Capreol area and between the Montreal-Ottawa area through North Bay to Sudbury-Capreol. From there, CP Rail's line followed the north shore of Lake Superior to Thunder Bay and then on to Winnipeg while the Canadian Northern and the National Transcontinental (now part of Canadian National) stayed inland north of Lake Superior, one route going directly to Winnipeg and the other to Thunder Bay and beyond to Winnipeg via Fort Frances.

The Algoma Central and the Ontario Northland Railroads were built for mining and development purposes, the former north from Sault Ste. Marie and the latter north from North Bay. There are three other common carrier railways serving Ontario. The Toronto, Hamilton and Buffalo (now owned by Canadian Pacific but run as a separate company) joins Brantford to Welland by way of Hamilton, the Essex Terminal Railway servies as a switching carrier in the Windsor area and the Mattagami Railroad provides connection between a paper mill and the Canadian National at Smooth Rock in Northern Ontario. Table 2 shows the mileage of common carrier railways in Ontario.

There are a number of other railway company names still in existance in Ontario but these are either companies whose lines are leased long-term to one of the major companies (e.g. Toronto, Grey and Bruce which is leased to Canadian Pacific) or companies solely owned by a larger company but whose name is preserved for legal or tariff reasons (e.g. Lake Erie and Northern owned by Canadian Pacific, Canada Southern owned by ConRail).

Many Ontario industries also have railway facilities. These range from trackage constructed to allow common carriers access to a company's plant, through companies who have their own motive power to enable then to move railway cars within this plant, up to complete railways which include track, freight cars and locomotives. International Nickel in the Sudbury area is an example of the last group of companies.

Over the years, the various rail lines have been maintained or upgraded in proportion to the tonnage moving and the railway's best estimate of future rail traffic potential. The system now consists of various segments of rail line, some capable of heavy tonnage, and/or high speed movement while others are only able to handle minimum loading at low speeds.

2. ROUTING & ORGANIZATION OF MOVEMENT IN ONTARIO

The routing and organization of rail freight car movement is primarily contingent on the volume and nature of the traffic to be moved at any one time and the points between origin and destination of the traffic. Consideration must also be given to whether the move is to be on a regular basis, a seasonal basis, a one-time only move, or whether the move constitutes one commodity only or a wide variety of commodities.

2.1 ROUTING CONSTRAINTS

In determining the route of railway traffic, there are a number of constraints that must be considered.

The quality and level of maintenance of the connecting rail links between the points of origin and destination has a bearing on the routing. For example, a railway branch line which has a low traffic volume will often be maintained to a standard that only permits the movement of cars with a gross weight (weight of car and lading) which is somewhat less than the gross weight permitted on the main line of the railway. Thus though the line in question might be the shortest distance between two points, it can not be used if the movement involved cars over a certain gross weight. Furthermore, if the anticipated volume of heavy cars was not large enough, it would not be economical for the railway to increase the maintenance on the line to permit the movement of the cars in question.

The location of the available routes to be travelled must be considered. The shortest connecting link is not necessarily the best route to follow; a good example of this is the rail connecting link between the steel mills at Hamilton and the new steel development at Nanticoke. The shortest link crosses 10 main streets in the middle of the City of Hamilton and intensive use of the line would seriously disrupt all the road vehicular traffic in downtown Hamilton. In addition, the route has serious adverse gradients up the Niagara Escarpment from Hamilton. Thus a more

appropriate routing would be via other lines not subject to such constraints, but which are more roundabout.

Another factor in determining the route to be used is the presence of physical obstructions on the route. Thus for movements between Detroit Michigan and Windsor, the width/height of the Con Rail railway tunnel under the Detroit River prevents many railway cars from using this route. Cars that are restricted include loaded trilevel automobile carriers and high cubic capacity box cars of the type used for the transport of automobile parts. These cars must be interchanged from the carrier that brings the car to Detroit to a carrier that can ferry the cars across the Detroit River.

Another constraint exists where the origin of a movement is on one railway and the destination is on another railway. Obviously the two railways must have a physical connection or there must be one or more other railways to act as intermediate carriers between the two. For example, while both CP Rail and the Chesapeake and Ohio serve St. Thomas, there is no physical connection between them. Movement between the two must use the Canadian National as an intermediate carrier.

If a movement is across the U.S. - Canadian border, Canadian and U.S. Customs must be accomodated. Over the years, the rail carriers have established with the Customs authorities appropriate procedures for the inspection of trains and their consists to reduce the delay at border crossings. Particular emphasis has been placed on reducing the barriers when trains move from one part of a country to another part by way of a second country. Movements of this type occur on the Canadian National between Manitoba and Fort Frances by way of the United States and on the various US carriers between the States of New York and Michigan by way of Ontario.

Rail traffic not crossing an international boundary but moving in and out of Ontario has no impediment to its free flow and the identification of the provincial boundaries is irrelevant to the movement of the rail freight.

2.2 AVAILABLE MEANS

In order to move railway cars from origin to destination, a railway must organize the cars into units for movement (trains) and must use a variety of facilities for this organization and movement (locomotives, yards and tracks). The glue that binds this mixture together is the operating personnel of the railway: train crews, yardmasters, supervisors.

The way a railway decides to combine the means open to it is a reflection of the historic development of the railway plant -- the location of the tracks and yards; the current condition of the railway plant; the type of traffic the railway handles; and the operating and marketing policies of the company. The following narrative is a compendium of the various options open to a railway and describes the circumstances under which particular options might be chosen.

2.2.1 Train Types

If there is to be a regular movement of the single commodity in very high volume, generally in the order of a million tons per year, and this over an extended number of years, the move would likely be organized on a UNIT TRAIN basis. A unit train may consist of from 50 to 100 or more railway vehicles of uniform design, generally built for the specific commodity to be handled and often having unique features not embodied in the construction of general freight cars. The rail vehicles of the unit train remain coupled together throughout the loading process, the loaded transportation move, the unloading process and during the empty return move to the point of origin for the next loading. In some instances, the loading and unloading facilities are designed to match the rail vehicles of the unit train; and, the maintenance of the train is carried out on a predetermined schedule to reduce time out of service. The capital investment in such a transportation system is generally very large and can only be justified when large volumes, moving over an extended number of years are available for transport. It does, however, result in low cost freight movement.

Unit Trains are not common in Ontario but an example is the movement of coal from Western Canada to Thunder Bay for Ontario Hydro.

If the rail freight to be moved is all of one commodity but not moving in sufficient volume to warrant a unit train, it can be organized into a SOLID TRAIN. There may be a single shipper and a single consignee or multiple customers who are located in the same general area. The cars when loaded are assembled into a solid train at a major terminal from whence they move to a distant terminal, either for unloading at the terminal or at adjacent points. The railway cars when unloaded then enter into the general stream of empties to be used wherever next required.

This type of movement is often used for seasonal movements when there is a large volume to move in a short-time period. Examples of this type of movement is the movement of some agricultural products during harvest season; the movement of sand and gravel during the construction season; and the movement of livestock from Western Canada to Ontario points in the fall after the roundup.

Another type of solid train movement is that which is organized for the automotive industry when automobiles and trucks are moving in volume.

Within the railway industry, a variation of the solid train principle is used for the movement of empty railway cars. In this case when the cars are released after being unloaded, they are moved to a central gathering point and then moved in a solid train to a terminal near the major loading area thus minimizing the transit time.

Between major industrial and population centres there is a consistent demand for the movement of all types of freight and for this purpose EXPEDITED SCHEDULED TRAINS are established between major terminals or between terminals and interchanges. These trains handle all types of commodities that are offered for carriage upon the railway. These expedited schedules generally originate and terminate at major railway yards where there is a capacity to organize the trains on a round-the-clock, seven day a week basis. For each train, a schedule is published showing the times that the train will arrive and depart each station the train serves along it route (these schedules are the same type as are

published for passenger trains or airline flights). The establishment of these schedules represents a balance of many factors. Unlike the case of unit trains which serve only one customer and one origin-destination pair or solid trains which at most serve a very few customers, and limited origin-destination pairs, trains running on expedited schedules serve many customers and many origin-destination pairs. Thus in determining what the appropriate schedule is for an expedited train, the railway must balance such factors as:

- the clock time by which the shipper can have his loaded car ready at each location and the minimum amount of time required to process a car from the shipper's siding to the outbound train;

- the clock time by which cars will be delivered in interchange from a connecting carrier and the minimum amount of time required to move the car from the interchange to the train;

- the clock time at each location where the train will terminate traffic, before which the consignee must have his railway cars placed and the minimum amount of time required to process the cars from an inbound train to the consignees siding;

- the clock time by which cars must be delivered in interchange to the connecting carrier and the minimum amount of time required to move a car from a train to the interchange;

- the arrival and departure times of trains of the same railway which will carry connecting traffic;

- the minimum amount of time for the train to travel between terminals;

- the competing demands of other trains for the resources of yards and the tracks available between terminals.

As part of establishing a schedule, it is also decided what intermediate stations a particular expedited schedule will serve. By way of example,

an extract from CP Rail's schedule showing trains operating from Toronto to Western Canada is shown below:

CP Rail Toronto-Western Canada Freight Train Schedules

		401	Day	405	Day	445	Day	955	Day
L	Toronto	2230	1	0240	1	1200	1	1500	1
A	Sudbury								
L									
A	Thunder Bay			0500	2	1440	2	0100	2
L				0630	2	1610	2	0130	2
A	Winnipeg	1120	3	1705	2	0400	3	0700	3

From the schedule, it can be seen that all of the trains do not serve the same points. Trains 401, 405 and 445 can provide Toronto to Winnipeg service while trains 405 and 445 provide Toronto to Thunder Bay service. Only train 955 provides service to Sudbury.

For each expedited scheduled train, a railway draws up a plan of how the train is to operate. A representative plan would be:

TRAIN X21 TORONTO TO VANCOUVER

SCHEDULE:	TORONTO	LVE 0450	ET	DAILY EXC SUNDAY AND MONDAY
	ACR CONNECTION	2230-2300	ET	PICK UP (LIFT) WESTERN CANADA TRAFFIC
	THUNDER BAY	0530-0630	CT	SET OFF THUNDER BAY TRAFFIC
	WINNIPEG	1735-2045	CT	SET OUT WINNIPEG TRAFFIC, LIFT WESTERN TRAFFIC REMARSHALL TRAIN

TRAIN SPECIFICATIONS: 90 CAR LIMIT
1.8 HORSEPOWER PER EQUIVALENT GROSS TON (THE GROSS WEIGHT OF THE TRAIN PLUS AN ALLOWANCE FOR TRAIN RESISTENCE.

MARSHALLING BLOCKS: FROM REAR

EX TORONTO	EX WINNIPEG
1. THUNDER BAY	1. VANCOUVER
2. WINNIPEG AND MAIN LINE BEYOND	2. LOWER FRASER VALLEY
3. SECONDARY MAIN LINE WEST OF WINNIPEG	3. CALGARY/EDMONTON

PULL TIMES:		TORONTO		
	CUSTOMER A	0150		
	CUSTOMER B	0250		
	CUSTOMER C	2359		

PLACEMENT TIMES:	THUNDER BAY		WINNIPEG	
	CUSTOMER A	0800	CUSTOMER A	0530
			CUSTOMER B	0600
			INTERCHANGE A	2359

MAIN CONNECTIONS:	FROM	TO
WINNIPEG	X51	X61

This plan shows for train X21:

The train specifications -- the train has a maximum allowable size of 90 cars. The train must be supplied with sufficient motive power to provide 1.8 horsepower per equivalent gross ton.

The train schedule --those stations at which the train will lift (pick up) traffic and the type of traffic that will be lifted; the station where the train will set out traffic and the type of traffic to be set out; what other work will be done e.g. at Winnipeg the train is to be remarshalled (all the cars are to be reclassified into appropriate destination blocks).

The order of marshalling blocks on the train.

The pull time for cars that are to be carried by the train i.e. the time that cars must be switched from the shippers' sidings in order to make connection with the train.

The time that cars from the train must be placed on the consignees' sidings or on interchanges with other railways at the various destinations of the train.

The major trains with which the specified train is to connect.

In order to handle freight that is not characterized by any of the types of movements so far mentioned, the railways operate EXTRA FREIGHTS. These extra freight trains run when and as required over routes that may have traffic originating or terminating at several different places

along the route. Such traffic is moved into a terminal, from which point the rail cars are generally organized into one of the other types of freight movement for handling to destination. The intermediate traffic points may be sidings of specific industries, other railway interchanges, railway junctions (such as Woodstock on CP Rail's London to Toronto line) or tracks that the railway provides for the accommodation of the shipper who may handle only a few cars per year. (The last type of trackage is called a team track, a reference to the time when teams of horses brought goods to the railway for loading.)

Within the limits of a railway terminal or yard, regular YARD ENGINE SHIFTS are used as required on a three shift per day basis to serve industry tributary to the yard or to organize the freight movements originating or terminating at the yard. The yard shifts generally work on an 8 hour, 5 day per week basis, with additional shifts as required to coordinate the service they provide with the needs of the industries within the limits of the yard. These yard shifts are the origin and destination contact, in a physical sense, between the railway and the industry.

Within major metropolitan areas or a large industrial location, regular ROAD SWITCHERS are sometimes employed. These road switchers move within a radius of some 30 miles of a terminal and serve all the industry within that area by delivering to the industry or assembling from the industry, the freight handled through that terminal. The road switcher is a combination of the freight train that moves a long distance, perhaps 100 miles or more, and the yard engine shift that works within a very limited area of a terminal. The road switcher was conceived in order to give industry a better rail service for the commodities requiring rail transportation.

Most rail traffic being interchanged from one carrier to another is handled in single or multiple car lots but not as a train. However, in some cases, the traffic may be handled in a RUN THROUGH TRAIN. This type of operation provides for the originating carrier the ability to make up a complete train for movement to another carrier and to operate the train to an interchange; at this point the crew changes from the

employees of the delivering railway to those of the receiving railways but nothing else on the train changes. All the cars, the locomotives and the caboose are moved to the destination terminal of the receiving road. This reduces the time that is required at an interchange and provides for a more efficient use of railway cars and locomotives.

There are a number of examples of run through trains in Ontario. CP Rail and the Chesapeake and Ohio railways operate a run through from C&O's Detroit yard through to CP Rail's Toronto yard with a change of crews in Windsor. Another example is the run through train that operates between Buffalo, N.Y. and Toronto via ConRail, the Toronto Hamilton and Buffalo and CP Rail.

As well as rail freight that can be loaded by industry into or on top of a rail freight vehicle, there is another type of rail transportation available to the shipping public known as INTERMODAL, consisting of piggyback and containers. This service is a combination of road vehicle service and rail service. Containers or highway trailers are loaded by the shipper, picked up and moved over the road to an intermodal terminal, from which point the trailer or the containers are placed upon a specially designed railway flat cars and moved over the railway to the intermodal terminal closest to the ultimate destination. From this point the containers or trailers are unloaded from the train, picked up by a highway tractor and delivered to their ultimate destination. The intermodal means enables shippers/ receivers to use rail freight service without having to install expensive rail siding facilities at their plants, yet still obtain the benefit of rail service. It may also reduce the railway's time and expense of moving railway cars between a main yard and a customer's siding.

Intermodal traffic may be moved on expedited scheduled trains but more often when the volume warrants, it is handled in solid trains. These trains move from the intermodal terminal in one city to the intermodal terminal in another city.

2.2 Yards

In the operation of a railway, the center of activity is the railway yard. In a railway yard, the functions that may be performed include the making up of trains, the breaking up of trains, the inspection and repair of railway cars and locomotives, the preparation of cars for loading and the dispatch and receipt of cars to and from customers' sidings.

These activities can be divided into three general groupings and these correspond to the three kinds of railway yards -- classification yard, train service yard and industrial yard.

In a CLASSIFICATION YARD, railway cars which arrive from local customers, from interchange with other railways, and from inbound trains are sorted (or classed) into groups, the groups corresponding to the destination areas for the cars. For example, the Toronto classification yard groups would include local Toronto industrial yards, local Toronto interchanges, Hamilton, destinations west of Toronto but east of Hamilton and many others. The number of groups and the destinations included within a group is a function of the destinations that the trains running from the yard serve and the physical capacity of the yard. The whole concept in performing classification is to enable a train to be made up in which such a way that all cars that will be taken off the train at a particular location are in one place thus minimizing the work that a train crew and subsequent yard crews have to do along the train's route.

For example, CP Rail has an expedited schedule train running west from Toronto to provide service to Woodstock, London, Chatham and Windsor. Toronto classifies the cars it receives into groups to correspond to these four areas. Hence when the train is made up (or marshalled) all Woodstock cars are together, all London cars are together and so on. Further the train is put together so that the Woodstock cars (or the Woodstock block) is behind the engine, the London block is next and so on. Thus when the train stops at Woodstock, all the train crew has to do is to uncouple (or cut) the train between the last Woodstock

car and the first London car and then set the Woodstock cars in the Woodstock yard. This minimizes the time that the train must spend at Woodstock.

To perform this classification, a class yard has a number of parallel tracks; each track is designated for a particular destination group. An unsorted string of cars is then sorted by being placed on the appropriate track. The method of doing this can be very simple -- a yard shift pushes each car individually onto its appropriate track -- simple but slow and depending on traffic volumes and mix of traffic not efficient enough to permit a railway to survive. A more efficient method is provided by a hump classification yard. In Ontario, there are two major yards of this type, both close to Toronto, one run by CP Rail, the other by Canadian National. In these yards a continuous string of cars is pushed to the crest of a hill (or hump) and at this point the single track divides into over 50 tracks, each track corresponding to a classification. Gravity provides the force for the car movement while computers control the switches that determine the car's route and the retarders that determine the car's speed. Each of these classification yards handles up to 3,000 cars per day, 7 days a week.

The yards are large, use up a lot of real estate, have some environmental disabilities for surrounding properties and in their present location could not be duplicated for an expenditure under $100,000,000 each. However, it is doubtful if the present day levels of rail traffic could be handled if the railway did not have these efficient classification yards but rather had to resort to methods used 30 years ago.

Because of the efficiency of the Toronto classification yards, both CP Rail and Canadian National try to make these yards perform much of the classification work for Southern Ontario. That is, other yards in Southern Ontario only do enough classification of cars originating in their area to separate those groups that will not pass through Toronto from the cars that will pass through Toronto. At Toronto, the finer destination classifications are then made. Hence Windsor classifies cars into the various destination groups west of Toronto and leaves the classification for cars destined to Toronto and to east and north of Toronto to the Toronto yards.

For cars going west from Toronto towards Windsor, the Toronto yards will not just classify by destination yard but as far as possible will also classify by major destination areas within the destination yard. Thus for example, the breakdown for Windsor would include separate groups for each of the railways to which cars will be interchanged at Windsor. This results in significantly less classification work having to be performed at the smaller yards.

The arrival and departure of trains on a railway takes place in a part of the yard known as the TRAIN SERVICE YARD. In a train service yard, the cars on an arriving train are inspected for mechanical defects; repairs are made; the locomotives are refuelled; cars are added or subtracted from the train; and the train is made ready for departure. Also at most train service yards, the crew of a train changes. As well, a train service yard acts as a "surge tank" where trains can be held until there is capacity from them on the main line.

In a large center like Toronto, the train service yard has two parts, an arrival area and a departure area with the classification yard between. Generally, all trains are broken up at such a center and the cars reclassified. In smaller centers such as MacTier, Schreiber, Kenora, Foleyet and Sioux Lookout, the train service yard is just a few tracks alongside the mainline where through trains can be inspected before continuing their journey.

While classification and train service yards are concerned with wholesale groups of cars, the retail yard of the railway is the INDUSTRIAL YARD. This is the yard with which the individual customer has contact.

In one sense, an industrial yard is a small classification yard. Cars for local customers are received from outside the area and are sorted to correspond with the areas served by yard shifts. Similarly, cars brought in by yard shifts are assembled for movement to the main classification yard. The industrial yard also acts as a temporary storage area: for loaded cars for which a customer currently does not have space; and for empties which are currently not wanted in the area but for which a demand is expected shortly.

In an area like Toronto, there are a number of industrial yards serving local industry; these would include West Toronto, Parkdale, Weston and Leaside.

2.2.3 Example of a car movement

To illustrate how the various means are combined to move traffic, we can examine how a carload of general commodity traffic might move from London to Calgary. The journey starts when the customer advises the local operating office that the car has been loaded. A yard engine shift picks up the car and moves it to the London yard where it is sorted into a Toronto classification (note that the London yard is a small yard which serves all three functions, classification, industrial and train service). An expedited schedule exists from Windsor to Toronto to handle traffic originating at Chatham, London, etc. Upon arrival of the train at London, all of the cars on the train are inspected; the London originating cars are added to the train; the London train crew takes charge of the train; the train is checked; and then train departs for Toronto.

At Toronto, the cars of the train are inspected on arrival; all the cars on the train are put over the hump and the car we are following classed onto the track with other Calgary cars.

As the departure time for the Western train approaches, a yard engine shift makes up (or builds) the train. Each track containing cars for the train is pulled by a yard engine in the order that the destination block is to be placed on the train, the Calgary block being pulled after the Regina block. After all the train is assembled, the train is inspected, the train crew boards and the train departs.

As the train proceeds across Canada, at intervals of about 125 miles, the train passes through a series of train service yards where inspection of the cars is carried out and the train crews are changed.

When the train arrives at Calgary, the cars are put over the hump and the Calgary destined cars are classed into groups corresponding to areas served by local yard shifts. The car is then moved by a yard shift engine to the consignee's siding.

3. TRAFFIC CURRENTLY BEING HANDLED

As mentioned previously, provincial boundaries in Canada do not form a constraint or a point of record for the movement of rail traffic and therefore it is difficult to give precise numbers as to the nature and volume of traffic moving within the geographic boundaries of Ontario. However statistics that were prepared for the year 1978 show that 114 million tons of rail freight originated or terminated within Ontario.

Chart 1 and Table 1 show volumes of traffic handled under various different commodity groups by all major railways within Ontario during 1978. Appendix 1 provides details of the flows.

It is not possible to break down the annual volumes to show how this traffic was organized for transit by the rail companies but some of the movements can be related to the methods of handling which were outlined on pages 8 to 14.

For example within the ores and concentrates group and the logs and pulpwood group, most of the movements are short from mine to smelter or cutting site to mill. Hence the moves are handled by road switcher.

Another movement shown on Chart 1 is grain. A major movement of this commodity is western Canadian grain moving to Thunder Bay. The majority of this movement is handled in solid trains from Western Canada to Thunder Bay. In addition, when Great Lakes navigation is closed solid trains are used to move grain from Thunder Bay to Atlantic and St. Lawrence ports.

As well, at Thunder Bay, Ontario Hydro receives large volumes of coal at a specially designed unloading facility. The coal is brought from Western Canada by unit trains using railway cars and motive power specifically designed for the service.

In addition, there is a regular movement of sulphuric acid which is produced as a by-product from the processing of ores at the smelters

located in the Ontario mining areas such as Sudbury. The acid is loaded in cars especially designed for the service at loading docks which permit the rapid loading of cars and then moved as a solid train to chemical companies located at one of several locations. These consignees are able to accept a complete train and unload the whole train at once. The cars when emptied are returned to the loading point along with other loaded and empty cars moving in the same direction. The difference with this movement as compared to a unit train movement is the volume does not permit continuous operation of the train.

Most of the other traffic handled is transit time sensitive in that the rail patrons schedule their activities closely with the arrival or departure of goods. Such traffic is organized to move on expedited schedules between major terminals within Canada or to or from trans-border points where U.S. rail carriers organize similar schedules. Often though the freight cars will be handled by a combination of methods. A car may be handled by a road switcher to an intermediate yard, an extra freight to a classification yard and a expedited schedule from there.

There are of course exceptional situations where the railways handle unique movements over a short time. Some years ago, the eastern United States railways suffered severe disruption as a result of a hurricane and in order for rail traffic to reach the New York/Boston area from the U.S. midwest, a great deal of it was routed through Sarnia/Windsor to Montreal, then south to U.S. destinations. The move consisted of about a dozen solid trains of United States traffic daily for a period of about 10 days until the U.S. rail lines had been restored.

From time to time, situations arise requiring special service. This could occur when other transport modes are unavailable or the load is unique to rail handling. An industry may require as few as 5 or 10 cars to be moved from its plant to another plant or to connect with a ship waiting in a port. The railway dedicates a single special train for the movement and completes the trip without delay in a minimum time. The move is given "express" service and the charges are commensurate.

This type of service is not encouraged by the railways since it detracts from the service given to all other patrons and interrupts the organized distribution of motive power, rolling stock and crews.

The majority of the traffic handled is on behalf of regular rail patrons that have routine shipping patterns and who depend on the consistent service year round that can be maintained by the railways. To sustain and develop industry regular dependable service is a prime requirement.

4. WORK MEASUREMENT

While Chart I gives an indication of the local tonnage handled, it does not represent the true measure of work done by the rail industry in Ontario. A better measure would be the ton-miles generated by the various classes of commodity. (A ton-mile is one ton of goods moved on mile.) However, such statistics are not available. To illustrate the difference between tons and ton miles consider the high tonnage of ores and concentrates moving in the Sudbury area. Because of the short distance involved, on average 30 miles from mine to smelter, each ton loaded only produces 30 ton-miles of work in Ontario. On the other hand, each ton of automobiles and trucks loaded in Ontario for Western Canada travels about 1,150 miles to the Ontario border producing 1,150 ton-miles.

5. SUMMARY OF FLOWS

In summary the major flows of railway traffic within Ontario are:

Between Quebec the New England States, and Ontario (Ottawa and East)

- and Toronto, South Western Ontario and US Mid Western States --along the Canadian National and CP Rail Lines running along the North Shore of Lake Ontario and through their South Western Ontario lines to destination or to interchange with US carriers at the Detroit and St. Clair Rivers. A small part of this flow moves on CP Rail's line though North Bay to connect with a US carrier at Sault Ste. Marie. The majority of this traffic moves on expedited freight schedules.

- and North Western Ontario and Western Canada -- Along the Canadian National and CP Rail lines through North Bay and across the top of Lake Superior. In the case of Canadian National the traffic follows the route through Armstrong and not through Thunder Bay. This traffic also moves on expedited scheduled trains for the most part.

From South Western and South Central Ontario to Northern Ontario and Western Canada, all traffic on both railways is brought into Toronto the vast majority of the traffic arrives Toronto yards by yard shifts from the Toronto industrial yards and by road switchers from the immediately surrounding area. After the cars are classified at the Toronto yards, they move on expedited scheduled trains North through the Sudbury area and continue North of Lake Superior. Canadian National traffic moves through Armstrong and not through Thunder Bay.

From Northern Ontario and Western Canada to South Western and South Central Ontario, all traffic moves on expedited scheduled trains into the Toronto yards. At the yards the traffic is classified and then moves on to destination -- yard shifts for Toronto; road switchers for the immediately surrounding area; and expedited freight trains for further destinations.

From Sault Ste Marie

- to Western Canada -- Algoma Central to Franz and onward via CP Rail through Thunder Bay or to Oba and onward via Canadian National through Armstrong;

- to southern Ontario and Quebec - CP Rail direct or to Oba and onward via Canadian National.

Most of this traffic moves on expedited scheduled trains. The schedules of the Algoma Central and those of CP Rail and Canadian National are so planned that there is minimal delay at the Franz and Oba Interchanges.

Between the States of Michigan and New York, via Con Rail (Windsor to Niagara Falls) or Norfolk and Western or Canadian National (Windsor to Fort Erie) or Chesapeake and Ohio (Sarnia to Niagara Falls). For the interstate moves expedited scheduled trains are used while extra freights are used for local work within Canada.

Between Thunder Bay and Western Canada -- CP Rail direct or Canadian National line via Fort Frances. This flow includes various commodities that move by ship from Ontario ports to Thunder Bay, at which point the goods are loaded onto rail.

Between Western Canada and the United States -- major movement via Canadian National's line through Rainy River to Fort Frances with interchange to US carrier at Fort Frances. Smaller movements via both Canadian National and CP Rail to US connections at Windsor, Sarnia, and Niagara Falls.

APPENDIX I

ONTARIO RAILWAY TRAFFIC FLOWS

No complete flow statistics are published that show traffic to, from and through Ontario. Statistics Canada in "Railway Freight Traffic" publishes figures to show tonnage originating in Ontario, terminating in Ontario, delivered to U.S. carriers at Ontario borders, and received from U.S. carriers at Ontario borders. But this publication does not give flows, e.g., Ontario to Ontario, Ontario to Western Canada, etc., nor does it cover traffic between other provinces which passes through Ontario.

The CTC has published some flow studies but these are based only on CN and CP figures and exclude the traffic handled by the other Ontario carriers. In addition certain types of traffic are excluded.

The published statistics do indicate that:

1. There is a heavy intra Ontario flow. However these numbers are weighted by ores, concentrates, logs and pulpwood.

2. Ontario is the major province of entry (60%) and exit (50%) for railway traffic to and from the United States. A part of this traffic, though a declining part, is the overhead traffic by the U.S. carriers between the Detroit/St. Clair and Niagara Rivers. Also included as traffic interchanged in Ontario with U.S. carriers is Canadian National's interchange to the Duluth, Winnipeg and Pacific at Fort Frances. This interchange primarily serves movements between Western Canada and the United States.

3. An estimate of the breakdown of traffic flow is:

-	within Ontario	20%
-	to/from rest of Canada	50%
-	to/from United States	15%

- overhead - Canada to Canada
  - Canada to U.S. 15%
  - U.S. to Canada
  - U.S. to U.S.

An analysis of Statistics Canada "Railway Freight Traffic" is summarized in Table I and Chart I. A more detailed analysis follows.

It should be noted that:

1. The tonnages do not include movements between other provinces or between other provinces and the United States (except those movements where the point of interchange with the U.S. carrier is in Ontario). Hence a comparison of originating and teminating tonnages may not indicate intra Ontario flows.

2. The tonnages do include as originated in Ontario goods received from a water or motor carrier in Ontario. Similarly terminated tonnages include goods delivered to a water or motor carrier in Ontario.

The symbol .. has been used to indicate movements of less than 50,000 tons.

DETAIL RE ONTARIO RAILWAY TRAFFIC - 1978

	Loaded	Unloaded	Interchanged with U.S. Rails ----Received----- Destined to Can.	Destined to U.S.	Delivered
	(000,000 tons)				
ORES AND CONCENTRATES	15.9	15.3	0.1	..	0.2
Iron Ore	10.8	10.6	..	..	..
Copper-Nickel & Nickel Ore/Conc.	4.4	4.4	-	-	-
Zinc Ore/Conc.	0.4	..	..	-	0.1
Copper Ore/Con.	0.2	..	-	-	0.1

Iron ore is short haul; most of movement is within the Algoma Central.

Copper-nickel and nickel ores and concentrates are short haul and are mostly within the Sudbury Area.

Copper and zinc ores and concentrates originate on the Ontario Northland and on Canadian National and Canadian Pacific in the Manitouwadge area. The movement is to Noranda (copper) and to the United States (zinc).

	Loaded	Unloaded	Interchanged with U.S. Rails: Received: Destined to Can.	Received: Destined to U.S.	Delivered
	(000,000 tons)				
GRAIN	1.5	15.8	0.3	0.4	0.2
Wheat	0.1	11.5	..	..	..
Barley	0.1	3.2	..	..	..
Corn	0.3	..	0.2	0.3	0.1
Oats	..	0.3	..	..	..
Oil Seeds	..	0.6	..	..	..

The major grain movement is statutory grain moving from Western Canada to the elevators at Thunder Bay. Other significant movements are: non-statutory grain moving to the Thunder Bay elevators; grain from Thunder Bay and Georgian Bay ports to St. Lawrence and Atlantic ports during winter freezeup; corn from the midwestern United States and Southwestern Ontario to Quebec and Eastern United States.

OTHER MINE PRODUCTS	3.9	6.3	2.1	0.2	1.0
Limestone	2.1	2.1	..	..	..
Coal	..	1.0	0.2	..	..
Salt	0.6	0.2	..	0.1	0.1
Industrial Sand	0.1	0.6	0.6	..	..
Phosphate Rock	-	0.6	0.6	..	..
Coke	0.2	0.2	..	0.4	..
Nephlene Syenite	0.4	..	..	..	0.3
Gravel	0.3	0.3	..	..	..
Clay	..	0.3	0.3	..	..
Sulphur	..	0.2	..	..	..
Asbestos	..	..	..	..	0.3

The major movements of other mine products are: shorthaul within Ontario (limestone, gravel); imports from the United States (industrial sand, phosphate rock, clay and coal); coal from Western Canada for Ontario Hydro at Thunder Bay; asbestos moving overhead from Quebec to the United States;

nephlene syenite from the Havelock area to Quebec and the United States; and salt from Windsor and Goderich to various destinations in Canada.

	Loaded	Unloaded	Interchanged with U.S. Rails: Received: Destined to Can.	Received: Destined to U.S.	Delivered
	(000,000 tons)				
LOGS, PULPWOOD	4.3	3.9	..	..	0.3
Pulpwood Logs	2.3	2.1	..	..	0.2
Pulpwood Chips	1.0	0.8	..	..	0.1
Logs	1.0	1.0	..	..	..

This is largely a shorthaul intra Ontario movement. The movements to the United States are also shorthaul cross border.

	Loaded	Unloaded	Destined to Can.	Destined to U.S.	Delivered
CHEMICALS, ACIDS & FERTILIZERS	3.2	3.1	1.2	0.3	4.5
Sulphuric Acid	0.6	0.5	..	..	0.2
Potash	..	0.5	..	-	3.6
Sodium Products	0.3	0.3	0.1	..	..
Fertilizers	0.4	0.1	..	0.2	0.2

The published statistics do not allow most of the commodities grouped under the heading chemicals to be singled out. The majority of the chemicals do originate in the Sarnia area for movement to various parts of Canada and the United States. Sulphuric acid is a byproduct of the smelter operations at Sudbury and Noranda with the major movement to Southern Ontario and the United States. Sodium products include carbonate originating in the Windsor area for movement to the glass and chemical industry and sulphite moving from Western Canada to Ontario paper mills. The heavy deliveries of potash to U.S. rail carriers is largely accounted for by Canadian National's interchange with their U.S. subsidy, the DW&P, at Fort Francis, Ont. The potash tonnage terminating in Ontario includes movement to Thunder Bay for subsequent water movement to the United States.

	Loaded	Unloaded	Interchanged with U.S. Rails: Received: Destined to Can.	Interchanged with U.S. Rails: Received: Destined to U.S.	Interchanged with U.S. Rails: Delivered
	(000,000 tons)				
PRIMARY METALS	3.1	2.1	0.3	0.3	1.0
Manufactured Iron & Steel	2.6	1.3	0.3	0.3	0.6
Primary Iron & Steel	0.2	0.4	..	..	0.1
Aluminum	..	0.1	..	..	0.1
Zinc	0.1	0.1	..	..	0.1

Iron and steel movements are widespread and cover intra Ontario movements, interprovincial movements and international movements.

	Loaded	Unloaded	Destined to Can.	Destined to U.S.	Delivered
AUTOS, TRUCKS & PARTS	3.0	2.1	1.9	0.7	2.3
Motor vehicle engines, accessories, parts and assemblies	1.3	1.8	1.8	0.5	1.4
Passenger automobiles	0.7	0.2	0.1	0.2	0.6
Road motor vehicles n.e.s.	0.8	..	0.1	..	0.3
Rubber tires & tubes	0.2	..	..	..	..

The major movement of parts consists of: Ontario manufacturers to U.S. automotive manufacturers and to General Motors at Ste. Therese, Quebec; U.S. producers to Ontario and Quebec automotive manufacturers; and overhead movements from United States manufacturers to United States automotive plants via Ontario.

The movement of automobiles and trucks includes both cross border and interprovincial movements.

	Loaded	Unloaded	Interchanged with U.S. Rails ----Received----- Destined to Can.	Destined to U.S.	Delivered
		(000,000 tons)			
GASOLINE, FUEL OIL & PETROLEUM PRODUCTS	2.2	2.9	0.2	0.1	0.5
Diesel Oil	0.7	1.3	..	..	..
LPG	0.5	0.2	..	..	0.4
Gasoline	0.3	0.3	..	-	..
Fuel Oil	0.1	0.1	..	..	..
Lubricating Oils & Greases	0.2	0.2	..	..	..
Asphalt	..	0.3	..	..	..

Most of the gasoline and fule oil loadings represents loadings on the Ontario Northland. LPG largely originates in the Sarnia area with a major part of the movement going to the United States. Asphalt is basically a movement from Quebec to Ontario. The other commodities are largely intra Ontario movements.

LUMBER & OTHER BUILDING PRODUCTS	2.5	2.6	0.5	0.2	4.1
Lumber	0.5	1.2	0.1	0.1	3.1
Cement	0.7	0.5	..	..	0.1
Lime	0.3	0.2	..	..	0.1
Plywood & Veneer	0.2	0.3	..	..	0.2

The major lumber movements are from Western Canada to Ontario and to the Canadian National's subsidiary, the DW&P, at Fort Francis. There is a large movement of cement from Southern Ontario producers to the Sudbury area mines.

	Loaded	Unloaded	Interchanged with U.S. Rails: Received: Destined to Can.	Received: Destined to U.S.	Delivered
	(000,000 tons)				
PULP & PAPER	2.9	1.9	0.2	0.2	4.5
Newsprint	1.3	0.5	..	..	1.7
Woodpulp	1.2	0.5	..	..	1.4
Paperboard	0.3	0.5	0.1	0.1	0.1
Groundwood Printing & Specialty Paper	0.1	0.2	..	..	1.1

The major movement of pulp and paper is from Ontario and Quebec producers to the United States. Other large movements are from Ontario and Quebec newsprint manufacturers to Toronto area newspapers and Ontario woodpulp producers to paper and paperboard manufacturers in Ontario and Quebec.

	Loaded	Unloaded	Destined to Can.	Destined to U.S.	Delivered
CONTAINERS & PIGGYBACK	2.2	2.3	0.2	..	0.1
Containers, except Plan II	1.2	1.6	0.2	..	0.1
Trailers, except Plan II	1.0	0.7	..	..	..

Tonnages as shown include traffic moving under Plan I (motor common carrier or shipping line owned container or trailer), Plan III (shipper owned container or trailer), Plan IV (shipper owned container or trailer and conveying flat car - little or no movement currently), Plan V (railway and motor common carrier jointly provide a rate from origin to destination, trailer or container may belong to either railway or motor carrier). Excluded is Plan II - railway owns container or trailer.

Most of the container movements are movements between Ontario and overseas points with rail being used to or from the port. There is also an overhead movement through Ontario of containers between the United States and overseas via Canadian ports. The largest part of the trailer

is between Ontario and Western Canada with smaller movements between Ontario and Quebec and the Maritimes.

	Loaded	Unloaded	Interchanged with U.S. Rails ----Received----- Destined to Can.	Destined to U.S.	Delivered
		(000,000 tons)			
ALL OTHER	7.2	4.4	2.9	1.4	2.2

There are a large number of commodities included in the above group. Some of the major ones are:

FRESH FRUIT & VEGETABLES	..	0.3	0.4	..	..

This movement is from the Detroit/St. Clair Rivers interchange with U.S. carriers to the Toronto and Montreal markets. Also there is a significant movement of potatoes from the Maritimes terminating in Ontario.

GRAIN PRODUCTS	0.6	0.2	..	0.4	0.3

The movement of grain products includes large movements of flour for overseas export.

OTHER FOODS & BEVERAGES	0.8	0.5	0.4	0.2	0.3

There is a wide distribution pattern for these commodities. The major origin is Southern Ontario with destinations throughout Canada. There is also a significant movement of imports from the United States.

	Loaded	Unloaded	Interchanged with U.S. Rails: Received: Destined to Can.	Received: Destined to U.S.	Delivered
	(000,000 tons)				
ANIMAL & POULTRY FEED	0.8	0.4	0.3	0.3	0.2

This movement of feed from Ontario producers is primarily to the Ontario and Quebec markets.

CATTLE	..	0.1	..	-	..

While a small movement on an annual basis, cattle moves heavily in the fall from Western Canada to Ontario feed lots and packing plants.

IRON & STEEL SCRAP	0.7	1.1	0.3	..	0.2

The major movement is into the Ontario steel mills.

FREIGHT FORWARDERS & SHIPPER ASSOCIATION TRAFFIC	1.2	0.2	..	..	..

This traffic consists of less than carload size shipments which are consolidated by freight forwarder (also called pool car operators) and shipper associations into carload lots in order to achieve reduced movement costs. The movements are primarily from Ontario to Western Canada and the Maritimes. The volume of movement reflects the number of manufacturing firms in Southern Ontario.

There are many more commodities, mostly manufactured products, but the annual volume of any one commodity is usually less than 100,000 tons.

Table 1

ONTARIO RAILWAY TRAFFIC - 1978

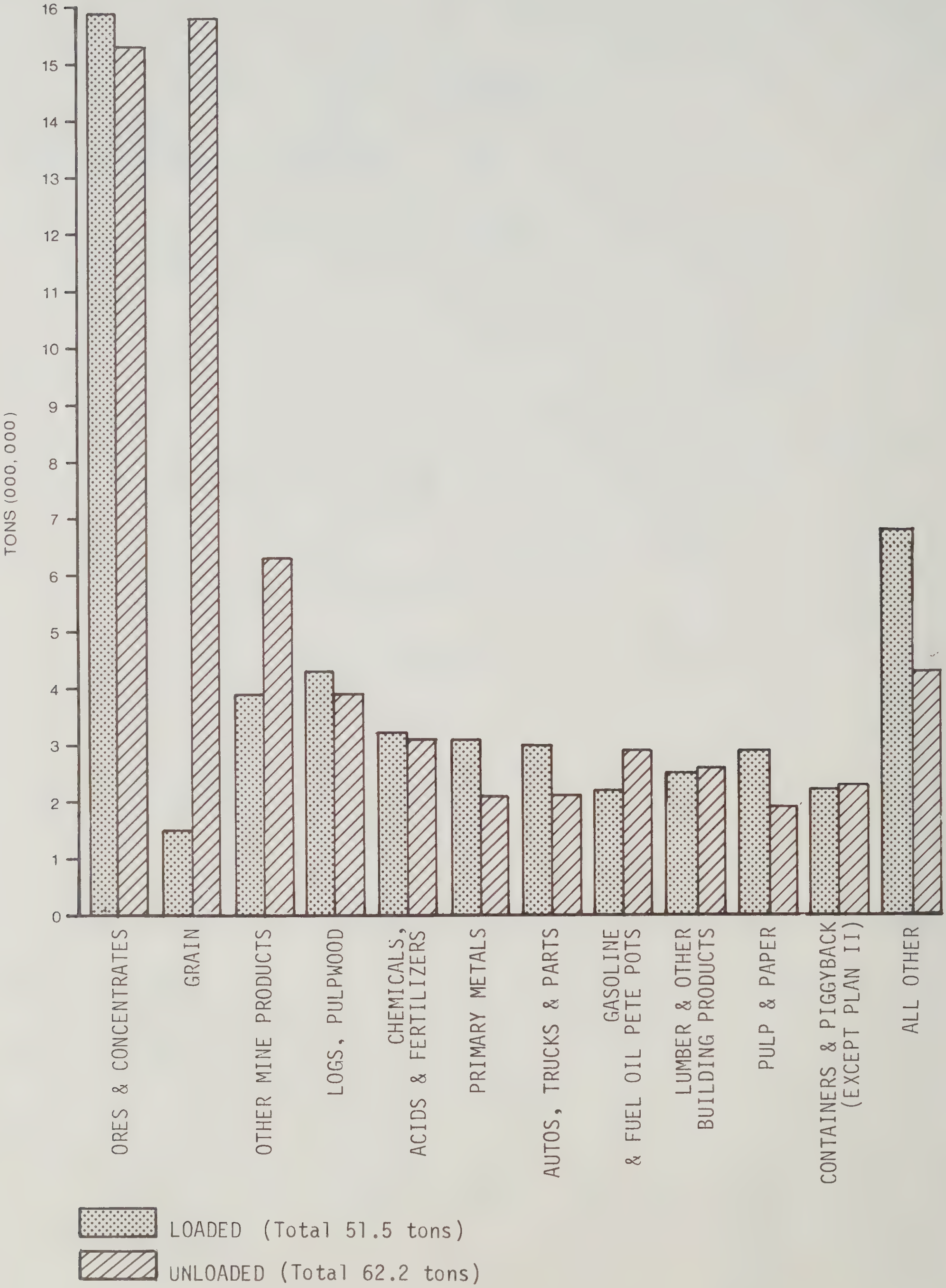
	Tons Loaded 000,000	Tons Unloaded 000,000
ORES & CONCENTRATES	15.9	15.3
GRAIN	1.5	15.8
OTHER MINE PRODUCTS	3.9	6.3
LOGS, PULPWOOD	4.3	3.9
CHEMICALS, ACIDS & FERTILIZERS	3.2	3.1
PRIMARY METALS	3.1	2.1
AUTOS, TRUCKS & PARTS	3.0	2.1
GASOLINE, FUEL OIL & PETE PDTS	2.2	2.9
LUMBER & OTHER BUILDING PRODUCTS	2.5	2.6
PULP & PAPER	2.9	1.9
CONTAINERS & PIGGYBACK (Except Plan II)(1)	2.2	2.3
ALL OTHER	6.8	4.3
	51.5	62.6

(1) Plan II is the movement of railway owned trailers or containers. The figure shown covers the movement of motor common carrier trailers and containers, shipper owned trailers and containers and shipping line owned containers.

Source: Railway Freight Traffic 1978, 52-205
Statistics Canada

36

Chart I
ONTARIO RAILWAY TRAFFIC - 1978



SOURCE: RAILWAY FREIGHT TRAFFIC 1978, STATISTICS CANADA

Table 2

LENGTH OF FIRST MAIN TRACK IN ONTARIO BY RAILWAY 1978[1]

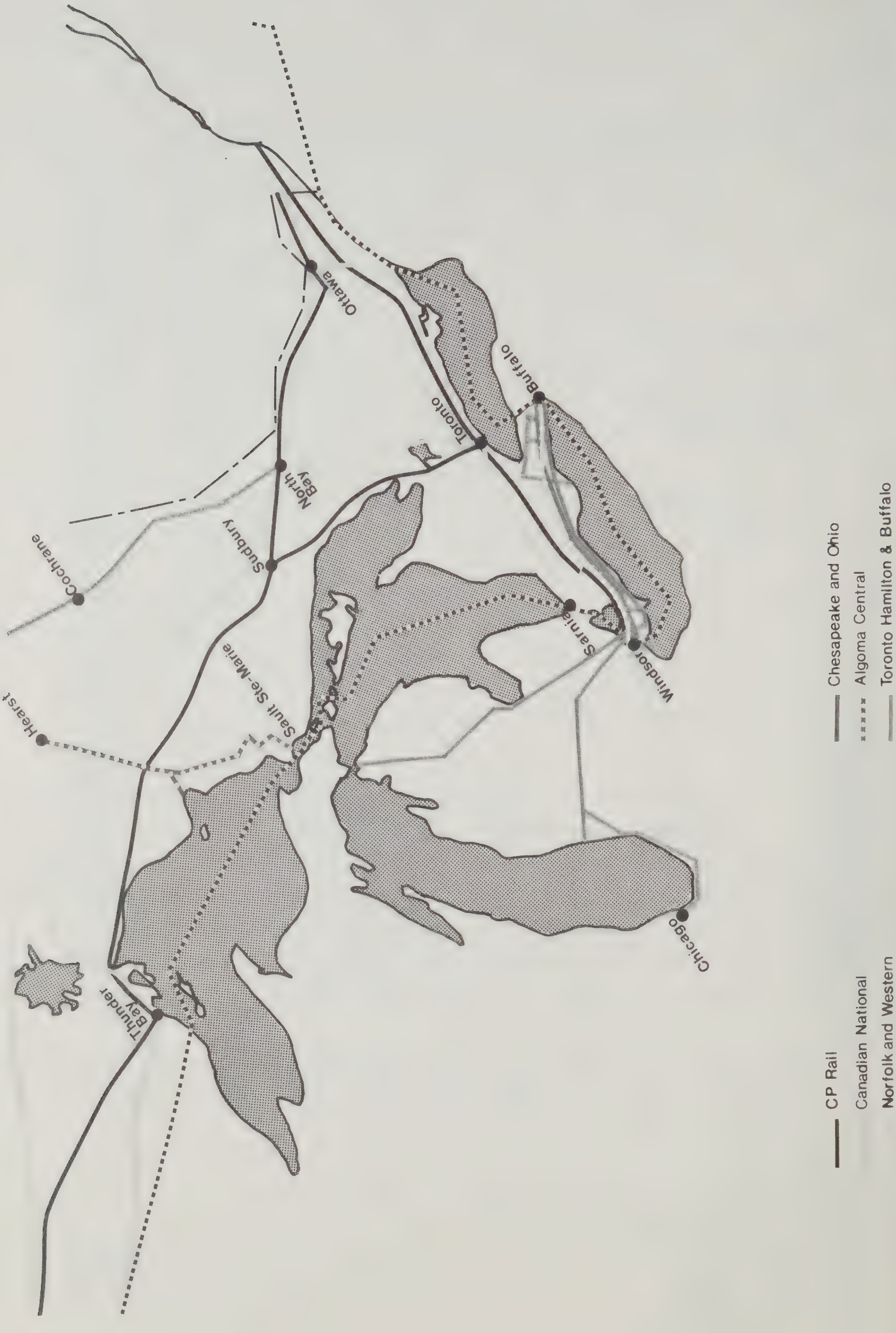
	Miles
CANADIAN NATIONAL	5,131
CP RAIL	3,191
ONTARIO NORTHLAND	547
ALGOMA CENTRAL	321
CON RAIL	278
CHESAPEAKE & OHIO	191
ALL OTHER[2]	128
TOTAL	9,756[3]

(1) First main track is the length of single track extending the entire distance between terminals used to effect the movement of trains and thus kept clear for the passage of trains. It does not include sidings or yard tracks. Where there is two or more parallel main tracks, only the mileage of the first track is counted.

(2) Essex Terminal, Norfolk & Western, Toronto, Hamilton & Buffalo

(3) Adjusted to eliminate duplicate reporting of joint track (track owned by one railway and used by one or more other railways).

Source: Railway Transport, Part III 1978, 52-209
Statistics Canada


Ottawa
Toronto
Buffalo
North Bay
Sudbury
Cochrane
Sarnia
Windsor
Sault Ste-Marie
Hearst
Chicago
Thunder Bay
CP Rail
Canadian National
Norfolk and Western
Ontario Northland
Chesapeake and Ohio
Algoma Central
Toronto Hamilton & Buffalo

RAIL COMMODITY FLOW DATA

Numbers of railway cars and
weights of shipments for
major commodity groups

compiled and arranged
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for
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Economic Policy Office.

Rail Office,
Transportation Programs Division,
Ministry of Transportation and
Communications.

September, 1980.

RAIL COMMODITY FLOW DATA

CONTENTS

COMMODITY FLOW ANALYSIS

CARLOAD ALL-RAIL TRAFFIC

- between Ontario and other Canadian Provinces, 1977

  Tables 1 - 11

- between Ontario and the United States, 1976 and 1977

  Tables 12 - 19

PREFACE

The following explanatory notes are reproduced from source documents of the Canadian Transport Commission and qualify the data presented in tables on commodity flow - carload all-rail traffic originated and terminated in Ontario (1977) as well as between Ontario and the United States (1976 and 1977), namely:

1. "The data....was derived from the Computer tape records of Canadian National Railways and CP Rail. The program for extraction of the data was designed and prescribed by the Traffic and Tariffs Branch. The resulting computer tapes were used to derive the 27 statistical tables....

   The following types of movement were excluded from the program:

   a) Less-than-truckload traffic;
   b) Express and non-carload traffic;
   c) Lake-and-rail and Rail-lake-and-rail carload movements;
   d) Container traffic;
   e) All piggyback movements except Plan 1 (i.e., the trailers of highway transport common carriers);
   f) Interline traffic (i.e., traffic moving over the lines of two or more railways);
   g) Traffic originating and terminating on lines other than Canadian National Railways and CP Rail;
   h) Freight carried on company service (OCS); and
   i) Canada-United States traffic."

   The data "consists of a one-year (1977) analysis of local carload revenue traffic only. It was not found feasible to separate, with a reliable degree of accuracy, export and import traffic via Canadian ports from domestic traffic to or from such ports. Thus, the term "local carload revenue traffic" includes export and import traffic via Canadian ports.

   The exclusion of interline traffic (i.e., traffic moving over the lines of two or more railways), does eliminate the possibility of double-counting and thus gives more reliable figures.... . In this connection, it is estimated that Canadian interline traffic is approximately 3% of the total originated tonnage of Canadian National Railways and CP Rail.

   It is estimated that the data.... approximates 60% of the total originated revenue tonnage on all classes of railways for all types of traffic. In terms of total originated revenue tonnage on Canadian National Railways and CP Rail, the data approximates 97% of the total tonnage of "local carload revenue traffic" originated by those railways."

2. ....This analysis includes import and export traffic from Canadian and American ports (i.e., to or from countries other than Canada and the United States) and also a small amount of traffic moving from an American origin to an American destination using Canadian railway lines on some segment of the movement. It is estimated that the data.... approximates 85%* of the total revenue tonnage on all classes of railways for all types of traffic moving from Canada to the United States and 63% of the total revenue tonnage on all classes of railways for all types of traffic moving from the United States to Canada."

   * NOTE:

   The calculation of this figure (percentage of total southbound traffic represented by this document) was altered in 1976 to exclude traffic received from U.S. rail connections destined to U.S. rail connections (overhead traffic) from the figure used for all classes of railways for all types of revenue freight traffic moving from Canada to the United States....

3. The commodity groupings used in tables are as follows:

   A. Canadian carload all-rail traffic - Ontario and other Canadian provinces:

      a) Statutory Grain and Grain Products;*
      b) Products of Agriculture (excluding Statutory Grain and Grain Products);
      c) Animals and Products;
      d) Products of Mines;
      e) Products of Forests;
      f) Manufactures and Miscellaneous; and
      g) Piggyback - Plan 1 (i.e., the trailers of highway transport common carriers).

      * NOTE:

      All grain and grain products which move under the Statutory Rate.

   B. Carload all-rail traffic between Ontario and the United States:

      a) Products of Agriculture;
      b) Animals and Animal Products;
      c) Products of Mines;
      d) Products of Forests;
      e) Manufactured and Miscellaneous Products.

- 5 -

COMMODITY FLOW ANALYSIS

CARLOAD ALL-RAIL TRAFFIC

originated and terminated in Ontario (1977) as well as carload all-rail traffic between Ontario and the United States (1976, 1977)

LIST OF TABLES

List of Tables (Cont'd)

TABLE 1

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS
- 1977 -

	A. ONTARIO ORIGINATED TRAFFIC				B. ONTARIO TERMINATED TRAFFIC			
MAJOR COMMODITY GROUPS	CARS	%	TONS	%	CARS	%	TONS	%
1. Statutory Grain and grain products	6,208	0.9	384	1.1	206,577	27.4	14,243	30.8
2. Products of agriculture	37,258	5.83	1,835	5.2	10,549	1.4	510	1.1
3. Animals and animal products	2,804	0.4	57	0.2	5,576	0.7	104	0.2
4. Products of mines	248,722	35.7	19,292	54.6	243,198	32.3	18,643	40.3
5. Products of forests	53,302	7.6	2,994	8.5	65,733	8.7	3,583	7.7
6. Manufactures and miscellaneous	273,115	39.2	9,370	26.4	168,645	22.3	8,130	17.6
7. Piggyback	75,460	10.9	1,430	4.0	54,557	7.2	1,070	2.3
TOTAL	696,869	100.0	35,365	100.0	754,835	100.0	46,283	100.0

SOURCE: Canadian Transport Commission, Traffic & Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, 1977, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 2

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS
TRAFFIC FLOW IN THOUSANDS (000's) TONS - ONTARIO, 1977

	Statutory Grain	Agriculture	Animals and Animal Products	Mine	Forest	Manufactures & Miscellaneous	Piggyback	All Commodities
ORIGINATED ONTARIO	384	1,835	57	19,292	2,994	9,370	1,430	35,363
FORWARDED WEST (-)		39	13	104	20	2,448	772	3,396
FORWARDED EAST (-)	321	1,504	43	1,535	45	3,641	569	7,658
RECEIVED FROM WEST (+)	14,180	135	87	594	274	940	473	16,685
RECEIVED FROM EAST (+)		84	16	395	379	3,909	506	5,288
TERMINATED (=)	14,243	510	104	18,643	3,583	8,130	1,070	46,283

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, 1977, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 3

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS
ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, 1977

TOTAL - ALL COMMODITIES: ORIGIN ONTARIO;
DESTINATION - PROVINCES:

	MARITIMES*	QUEBEC	ONTARIO	MANITOBA	SASKATCHEWAN	ALBERTA	BRITISH COLUMBIA	TOTAL
Cars	75,194	129,388	353,061	39,693	16,504	54,004	29,025	696,869
Tons	2,406	5,252	24,309	994	370	1,328	704	35,363
Revenue ($)	75,768	99,833	112,943	47,104	27,778	112,720	64,739	540,885
Ton-Miles	2,696,549	3,030,634	3,555,921	1,161,666	605,359	2,801,917	1,932,262	15,784,308
Car-Miles	82,416	66,731	58,743	47,996	27,558	113,808	79,663	476,915

NOTE: Tons, Revenue ($), Ton-Miles, Car-Miles in 000's

SOURCE: Caanadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, 1977, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 4

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS
PROVINCIAL ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS
TOTAL - ALL COMMODITIES, 1977

ORIGIN - PROVINCES	DESTINATION - PROVINCES															
	MARITIMES*		QUEBEC		ONTARIO		MANITOBA		SASKATCHEWAN		ALBERTA		BR.COLUMBIA		TOTAL	
	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
MARITIMES*	130,315	8,666	33,858	960	29,483	708	1,006	21	234	6	1,004	22	716	16	196,616	10,399
QUEBEC	56,293	1,465	117,105	6,522	100,956	4,580	14,345	303	4,348	86	16,995	452	11,598	236	321,640	13,644
ONTARIO	75,194	2,406	129,388	5,252	353,061	24,309	39,693	994	16,504	370	54,004	1,328	29,025	704	696,869	35,363
MANITOBA	3,526	131	12,148	440	67,311	3,868	49,733	2,994	11,462	572	10,347	326	8,367	369	162,894	8,700
SASKATCHEWAN	2,177	122	4,294	240	153,059	10,622	47,927	3,046	16,808	861	3,666	207	83,214	6,419	311,145	21,517
ALBERTA	1,551	80	15,210	554	26,853	1,394	11,227	494	14,179	938	44,346	3,123	184,772	14,682	298,138	21,264
BR.COLUMBIA	2,142	88	15,212	455	24,112	801	7,599	280	6,917	314	39,666	2,143	190,369	15,429	286,017	19,510
TOTAL	271,198	12,959	327,215	14,423	754,835	46,283	171,530	8,131	70,452	3,147	170,028	7,600	508,061	37,855	2,273,319	130,398

NOTE: Tons in 000's
* The four Atlantic Provinces, namely New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland are considered, for this commodity flow analysis, as a single "province" - Maritimes.

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 5

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS
PROVINCIAL ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS

STATUTORY GRAIN AND GRAIN PRODUCTS, 1977

ORIGIN - PROVINCES	DESTINATION - PROVINCES: MARITIMES*		QUEBEC		ONTARIO		MANITOBA		SASKATCHEWAN		ALBERTA		BR.COLUMBIA		TOTAL	
	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
MARITIMES*																
QUEBEC																
ONTARIO	1,682	98	3,455	223	1,064	63							7	x	6,208	384
MANITOBA	1,211	55	1,241	69	46,917	3,121	1,809	102					4,068	239	55,246	3,586
SASKATCHEWAN	1,070	46	754	35	144,562	10,094	14,177	803					57,189	3,927	217,752	14,905
ALBERTA	397	23	1,199	60	14,020	964	411	23					62,023	4,306	78,050	5,377
B.COLUMBIA					14	1							41	2	55	3
TOTAL	4,360	223	6,649	387	206,577	14,243	16,397	928					123,328	8,475	357,311	24,256

NOTE: Tons in 000's x - Total less than 500 tons

* The four Atlantic Provinces, namely New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland are considered, for this commodity flow analysis, as single "province" - Maritimes.

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, 1977, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 6

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS
PROVINCIAL ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS

PRODUCTS OF AGRICULTURE, 1977

ORIGIN - PROVINCES	DESTINATION - PROVINCES															
	MARITIMES*		QUEBEC		ONTARIO		MANITOBA		SASKATCHEWAN		ALBERTA		BR.COLUMBIA		TOTAL	
	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
MARITIMES*	3,955	108	2,562	71	2,523	72	3	x					4	x	9,047	251
QUEBEC	1,288	50	1,356	54	353	12	27	1	17	1	42	1	38	1	3,121	119
ONTARIO	18,669	1,019	11,982	385	4,840	291	633	15	207	4	596	11	331	9	37,258	1,835
MANITOBA	660	29	1,133	36	1,883	90	2,226	139	623	35	191	7	373	18	7,089	353
SASKATCHEWAN	112	5	362	15	517	28	5,774	390	1,415	88	1,289	74	1,453	92	10,922	693
ALBERTA	243	11	365	16	214	11	490	31	307	22	3,589	264	6,877	495	12,085	851
BR.COLUMBIA	83	2	239	7	219	6	126	3	140	3	269	7	321	19	1,397	47
TOTAL	25,010	1,224	17,999	684	10,549	510	9,279	579	2,709	153	5,976	364	9,397	635	80,919	4,149

NOTE: Tons in 000's x - Total less than 500 tons
* The four Atlantic Provinces, namely New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland are considered, for this commodity flow analysis, as a single "province" - Maritimes.

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, 1977, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 7

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS
PROVINCIAL ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS

ANIMALS AND ANIMAL PRODUCTS, 1977

ORIGIN - PROVINCES	DESTINATION - PROVINCES															
	MARITIMES*		QUEBEC		ONTARIO		MANITOBA		SASKATCHEWAN		ALBERTA		BR.COLUMBIA		TOTAL	
	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
MARITIMES*	28	x	1,076	19	897	15	7	x					3	x	2,011	34
QUEBEC	634	12	171	3	38	1	8	x			3	x	93	2	946	19
ONTARIO	1,512	29	625	14	73	2	262	6	5	x	3	x	324	7	2,804	57
MANITOBA	616	13	1,208	30	790	19	345	4	15	1	13	x	65	4	3,052	72
SASKATCHEWAN	61	1	516	12	1,484	25	26	1	21	1	28	1	79	4	2,215	44
ALBERTA	204	5	4,748	125	2,040	39	200	6	8	x	13	x	1,612	77	8,825	253
BR.COLUMBIA	2	x	8	x	254	4	6	x	6	x	8	x	20	1	304	6
TOTAL	3,057	61	8,352	204	5,576	104	854	17	55	2	68	2	2,195	94	20,157	485

NOTE: Tons in 000's x - Total less than 500 tons
* The four Atlantic Provinces, namely New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland are considered, for this commodity flow analysis, as a single "province" - Maritimes.

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, 1977, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 8

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS

PROVINCIAL ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS

PRODUCTS OF MINES, 1977

ORIGIN - PROVINCES	DESTINATION - PROVINCES: MARITIMES*		QUEBEC		ONTARIO		MANITOBA		SASKATCHEWAN		ALBERTA		BR.COLUMBIA		TOTAL	
	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
MARITIMES*	66,247	5,787	3,613	279	77	4			1	x					69,938	6,070
QUEBEC	14,136	387	16,634	1,317	5,162	391	33	2	16	1	1,345	127	175	4	37,501	2,228
ONTARIO	418	21	16,292	1,514	230,830	17,654	166	12	224	16	780	75	12	1	248,722	19,292
MANITOBA			782	71	277	22	31,724		3,116	253	1,287	126	269	26	37,455	2,627
SASKATCHEWAN	359	29	1,013	97	3,488	295	21,007	1,512	2,655	192	451	38	22,557	2,245	51,530	4,409
ALBERTA	218	21	793	72	890	75	407	29	6,524	500	21,860	1,726	84,963	8,066	115,655	10,490
BR.COLUMBIA			1,048	97	2,474	202	465	41	1,113	96	10,993	1,007	97,957	9,853	114,050	11,295
TOTAL	81,378	6,245	40,175	3,447	243,198	18,643	53,802	3,723	13,649	1,057	36,716	3,100	205,993	20,194	674,851	56,410

NOTE: Tons in 000's   x - Total less than 500 tons

* The four Atlantic Provinces, namely New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland are considered, for this commodity flow analysis, as a single "province" - Maritimes.

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, 1977, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 9

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS

PROVINCIAL ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS

PRODUCTS OF FORESTS, 1977

ORIGIN - PROVINCES	DESTINATION - PROVINCES: MARITIMES*		QUEBEC		ONTARIO		MANITOBA		SASKATCHEWAN		ALBERTA		BR.COLUMBIA		TOTAL	
	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
MARITIMES*	17,577	810	376	17	165	7	5	x	9	x	3	x			18,135	834
QUEBEC	2,865	131	45,820	2,236	7,640	372	53	2	11	x	30	1	18	x	56,446	2,744
ONTARIO	304	10	981	35	51,589	2,930	246	12	73	3	88	4	23	1	53,302	2,994
MANITOBA	9	x	7	x	96	5	3,146	172	1,137	69	4	x	15	x	4,414	247
SASKATCHEWAN	8	x	248	9	282	11	1,542	60	6,176	277	24	x	7	x	8,287	359
ALBERTA	13	1	73	3	149	4	129	4	45	2	500	33	147	10	1,056	56
BR.COLUMBIA	1,152	50	3,819	169	5,812	254	1,884	87	2,109	104	8,730	444	75,019	4,474	98,525	5,581
TOTAL	21,928	1,002	51,324	2,470	65,733	3,583	7,004	336	9,558	456	9,389	483	75,229	4,485	240,165	12,816

NOTE: Tons in 000's x - Total less than 500 tons

* The four Atlantic Provinces, namely New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland are considered, for this commodity flow analysis, as a single "province" - Maritimes.

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, 1977, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 10

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS

PROVINCIAL ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS

MANUFACTURES AND MISCELLANEOUS, 1977

ORIGIN - PROVINCES	DESTINATION - PROVINCES															
	MARITIMES*		QUEBEC		ONTARIO		MANITOBA		SASKATCHEWAN		ALBERTA		BR.COLUMBIA		TOTAL	
	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
MARITIMES*	36,416	1,911	21,414	494	19,086	494	564	16	185	4	800	18	448	19	78,913	2,949
QUEBEC	28,077	721	52,589	2,904	66,994	3,415	8,089	189	3,573	77	11,098	248	7,746	169	178,166	7,722
ONTARIO	42,888	1,071	74,215	2,570	59,846	3,281	24,145	628	12,836	298	38,619	988	20,566	534	273,115	9,370
MANITOBA	452	24	2,210	105	6,548	371	10,166	444	5,008	180	4,682	106	1,543	50	30,609	1,281
SASKATCHEWAN	513	39	910	61	2,008	152	4,240	264	6,394	300	1,311	85	1,751	148	17,127	1,048
ALBERTA	288	15	3,867	193	3,261	165	5,521	327	6,452	396	16,476	1,072	25,000	1,659	60,865	3,828
BR.COLUMBIA	857	35	7,201	134	10,902	252	3,061	108	2,808	95	14,278	586	16,847	1,078	55,954	2,289
TOTAL	109,491	3,817	162,406	6,462	168,645	8,130	55,786	1,976	37,256	1,349	87,264	3,103	73,901	3,650	694,749	28,487

NOTE: Tons in 000's   x - Total less than 500 tons

* The four Atlantic Provinces, namely New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland are considered, for this commodity flow analysis, as a single "province" - Maritimes.

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, 1977, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 11

CANADIAN CARLOAD ALL-RAIL TRAFFIC, COMMODITY FLOW ANALYSIS

PROVINCIAL ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS

PIGGYBACK (PLAN 1), 1977

ORIGIN - PROVINCES	DESTINATION - PROVINCES															
	MARITIMES*		QUEBEC		ONTARIO		MANITOBA		SASKATCHEWAN		ALBERTA		BR.COLUMBIA		TOTAL	
	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
MARITIMES*	6,092	50	4,817	80	6,735	117	427	5	39	1	201	4	261	4	18,572	261
QUEBEC	9,293	165	535	7	20,769	389	6,136	108	731	8	4,467	74	3,529	60	45,460	812
ONTARIO	9.721	158	21,838	411	4,819	89	14,241	321	3,161	49	13,918	250	7,762	152	75,460	1,430
MANITOBA	578	9	5,567	128	10,800	240	317	5	1,563	35	4,170	86	2,034	31	25,029	535
SASKATCHEWAN	54	1	491	11	718	16	1,161	16	147	3	563	9	178	4	3,312	59
ALBERTA	188	4	4,165	85	6,279	136	4,069	74	843	17	1,908	26	4,150	68	21,602	409
BR.COLUMBIA	48	1	2,897	48	4,437	81	2,057	41	741	16	5,388	99	164	2	15,732	289
TOTAL	25,974	387	40,310	769	54,557	1,070	28,408	570	7,225	129	30,615	548	18,078	321	205,167	3,794

NOTE: Tons in 000's x - Total less than 500 tons

* The four Atlantic Provinces, namely New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland are considered, for this commodity flow analysis, as a single "province" - Maritimes.

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Canadian Carload All-Rail Traffic, 1977, Reference Paper No. 1.5, Catalogue No. TT31-4/1977, Minister of Supply and Services Canada, 1980.

TABLE 12

CARLOAD ALL-RAIL TRAFFIC BETWEEN ONTARIO AND THE UNITED STATES
- FIVE MAJOR COMMODITY GROUPS FLOW ANALYSIS, 1976 AND 1977 -

A. FROM ONTARIO TO UNITED STATES

	Year	Products of Agriculture	Animals and Animal Product	Products of Mines	Products of Forests	Manufactured & Miscellaneous	Total, All Commodities
No. of Cars	1976	4,493	70	9,163	4,761	98,977	117,464
	1977	4,502	59	8,221	6,807	107,489	127,078
Tons	1976	227,396	3,216	762,028	212,229	4,172,548	5,377,417
	1977	248,590	2,778	689,032	314,948	4,867,232	6,122,580

B. FROM UNITED STATES TO ONTARIO

	Year	Products of Agriculture	Animals and Animal Product	Products of Mines	Products of Forests	Manufactured & Miscellaneous	Total, All Commodities
No. of Cars	1976	10,032	177	16,471	4,545	94,308	125,533
	1977	9,424	131	16,630	3,170	89,938	119,293
Tons	1976	363,291	8,161	1,075,194	191,126	2,997,869	4,635,641
	1977	382,561	6,691	1,072,655	126,067	2,801,409	4,389,383

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Carload All-Rail Traffic between Canada and United States, 1976, Reference Paper No. 3.3, Catalogue No. TT31-7/1978, ISBS: 0-660-01841-1, Minister of Supply and Services Canada, 1978; and 1977, Reference Paper No. 3.4, Catalogue No. TT31-6-1977, ISBN 0-660-50430-8, Minister of Supply and Services Canada, 1980.

TABLE 13

CARLOAD ALL-RAIL TRAFFIC BETWEEN ONTARIO AND THE UNITED STATES
TOTAL - ALL COMMODITIES FLOW ANALYSIS, 1976 AND 1977

A. FROM ONTARIO TO THE U.S. NINE MAJOR GROUPINGS

	YEAR	NE1	NE2	NC1	NC2	NC3	S1	S2	W1	W2	Total
No. of Cars	1976	7,439	25,429	27,811	21,343	11,145	15,712	4,117	1.920	2,548	117,464
	1977	8,581	26,851	30,756	25,176	11,947	14,795	4,219	1,729	3,024	127,078
Tons	1976	319,245	1,315,835	1,332,965	1,157,949	433,884	544,082	142,518	53,211	77,728	5,377,417
	1977	390,805	1,419,131	1,538,825	1,374,655	511,118	536,329	178,512	67,533	105,672	6,122,580

B. FROM THE U.S. NINE MAJOR GROUPINGS TO ONTARIO

	YEAR	NE1	NE2	NC1	NC2	NC3	S1	S2	W1	W2	Total
No. of Cars	1976	2,171	15,529	42,059	22,885	4,809	14,652	8,989	4,686	9,753	125,533
	1977	1,749	17,016	39,372	21,093	4,351	13,776	8,496	3,932	9,508	119,293
Tons	1976	85,401	558,900	1,292,218	796,961	170,032	651,963	451,667	229,909	398,590	4,635,641
	1977	66,369	552,003	1,184,880	731,993	160,579	639,494	441,586	208,786	403,693	4,389,383

NOTE: ton-miles, car-miles in 000's; Canadian revenue & American revenue in Canadian dollars. For the purposes of data for commodity flow analysis, the United States includes with the exception of Hawaii, all states plus the District of Columbia. The states have been grouped into nine major groupings based on the U.S. Census Divisions and on the examination by the Canadian Transport Commission of the traffic flow between Canada and the U.S.

NE1 - Northeast 1
Maine
New Hampshire
Vermont
Massachusetts
Connecticut
Rhode Island

NC1 - Northcentral 1
Michigan
Ohio

NC2 - Northcentral 2
Illinois
Indiana
Wisconsin

NC3 - Northcentral 3
Minnesota
Iowa
Missouri
North Dakota
South Dakota
Nebraska
Kansas

NE2 - Northeast 2
New York
New Jersey
Pennsylvania

S1 - South 1
Maryland
Delaware
Virginia
West Virginia
Kentucky
Tennessee
North Carolina
South Carolina
Georgia, Florida
District of Columbia

S2 - South 2
Alabama
Mississippi
Arkansas
Louisiana
Oklahoma
Texas

W1 - West 1
Montana
Wyoming
Idaho
Washington
Oregon
Alaska

W2 - West 2
Colorado
Arizona
Utah
New Mexico
Nevada
California

SOURCE: Canadian Transport Commission, Traffic & Tariffs Branch, Commodity Flow Analysis, Carload All-Rail Traffic between Canada & United States, 1976, Reference Paper No. 3.3, Catalogue No. TT31-7/1978, ISBS: 0-660-01841-1, Minister of Supply & Services Canada 1978; and 1977, Reference Paper No. 3.4, Catalogue No. TT31-6-1977, ISBN 0-660-50430-8, Minister of Supply & Services Canada, 1980.

TABLE 14

CARLOAD ALL-RAIL TRAFFIC BETWEEN ONTARIO AND UNITED STATES
- 1976 AND 1977 -

MAJOR COMMODITY GROUPS	YEAR	A. ONTARIO ORIGINATED TRAFFIC				B. ONTARIO TERMINATED TRAFFIC			
		NO. OF CARS	%	TONS	%	NO. OF CARS	%	TONS	%
1. Products of agriculture	1976	4,493	3.8	227,396	4.2	10,032	8.0	363,291	7.8
	1977	4,502	3.5	248,590	4.1	9,424	7.9	382,561	8.7
2. Animals & animal products	1976	70	0.1	3,216	0.1	177	0.1	8,161	0.2
	1977	59	0.0	2,778	0.0	131	0.1	6,691	0.2
3. Products of mines	1976	9,163	7.8	762,208	14.2	16,471	13.1	1,075,194	23.2
	1977	8,221	6.5	689,032	11.3	16,630	13.9	1,072,655	24.4
4. Products of forests	1976	4,761	4.1	212,229	3.9	4,545	3.6	191,126	4.1
	1977	6,807	5.4	314,948	5.1	3,170	2.7	126,067	2.9
5. Manufactures & miscellaneous	1976	98,977	84.2	4,172,548	77.6	94,308	75.2	2,997,869	64.7
	1977	107,489	84.6	4,867,232	79.5	89,938	75.4	2,801,409	63.8
TOTAL ALL COMMODITIES	1976	117,468	100.0	5,377,417	100.0	125,533	100.0	4,635,641	100.0
	1977	127,078	100.0	6,122,580	100.0	119,293	100.0	4,389,383	100.0

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Carload All-Rail Traffic between Canada and United States, 1976, Reference Paper No. 3.3, Catalogue No. TT31-7/1978, ISBS: 0-660-01841-1, Minister of Supply and Services Canada, 1978; and 1977, Reference Paper No. 3.4, Catalogue No. TT31-6-1977, ISBN 0-660-50430-8, Minister of Supply and Services Canada, 1980.

TABLE 15

ALL-RAIL TRAFFIC - TOTAL ORIGIN
FROM ONTARIO TO UNITED STATES
REVENUES, AVERAGE LENGTH OF HAUL, AVERAGE LOAD/CAR IN TONS, 1976 AND 1977

MAJOR COMMODITY GROUPS	YEAR	AVERAGE REVENUE/TON - $ TOTAL U.S. & ONTARIO	AVERAGE REVENUE/TON - $ ONTARIO PORTION	AVERAGE LENGTH OF HAUL (MILES TO INTERNATIONAL BOUNDARY)	AVERAGE LOAD/CAR (TONS)
1. Products of agriculture	1976	16.64	8.47	346	50.6
	1977	17.73	8.99	349	55.2
2. Animals & animal products	1976	35.17	14.95	337	45.9
	1977	39.66	13.53	282	47.1
3. Products of mines	1976	21.55	10.28	373	83.2
	1977	23.71	9.97	325	83.8
4. Products of forests	1976	18.38	8.22	130	44.6
	1977	20.20	8.06	116	46.3
5. Manufactures & miscellaneous	1976	33.60	12.78	342	42.2
	1977	33.50	12.66	341	45.3
TOTAL ALL COMMODITIES	1976	30.57	12.07	339	45.8
	1977	31.11	11.97	328	48.2

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Carload All-Rail Traffic between Canada and United States, 1976, Reference Paper No. 3.3, Catalogue No. TT31-7/1978, ISBS: 0-660-01841-1, Minister of Supply and Services Canada, 1978; and 1977, Reference Paper No. 3.4, Catalogue No. TT31-6-1977, ISBN 0-660-50430-8, Minister of Supply and Services Canada, 1980.

TABLE 16

ALL-RAIL TRAFFIC - TOTAL DESTINATION
FROM UNITED STATES TO ONTARIO
REVENUES, AVERAGE LENGTH OF HAUL, AVERAGE LOAD/CAR IN TONS, 1976 AND 1977

MAJOR COMMODITY GROUPS	YEAR	AVERAGE REVENUE/TON - $ TOTAL U.S. & ONTARIO	AVERAGE REVENUE/TON - $ ONTARIO PORTION	AVERAGE LENGTH OF HAUL (MILES TO INTERNATIONAL BOUNDARY)	AVERAGE LOAD/CAR (TONS)
1. Products of agriculture	1976	72.46	8.64	192	36.2
	1977	75.57	9.69	188	40.6
2. Animals & animal products	1976	44.46	11.81	231	46.1
	1977	40.72	11.20	187	51.1
3. Products of mines	1976	20.88	5.51	195	65.2
	1977	23.09	6.26	209	64.1
4. Products of forests	1976	50.68	8.20	271	42.1
	1977	54.62	9.06	255	39.8
5. Manufactures & miscellaneous	1976	38.53	14.49	209	31.8
	1977	40.94	16.10	212	31.1
TOTAL	1976	37.41	11.64	206	36.3
	1977	39.99	12.92	210	36.8

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Carload All-Rail Traffic between Canada and United States, 1976, Reference Paper No. 3.3, Catalogue No. TT31-7/1978, ISBS: 0-660-01841-1, Minister of Supply and Services Canada, 1978; and 1977, Reference Paper No. 3.4, Catalogue No. TT31-6-1977, ISBN 0-660-50430-8, Minister of Supply and Services Canada, 1980.

TABLE 17

ALL-RAIL TRAFFIC - AVERAGE LENGTH OF HAUL AND AVERAGE LOAD/CAR IN TONS, 1976, AND 1977

		A. FROM ONTARIO TO UNITED STATES - TOTAL ORIGIN -		B. FROM UNITED STATES TO ONTARIO - TOTAL DESTINATION -	
MAJOR COMMODITY GROUPS	YEAR	AVERAGE LENGTH OF HAUL (MILES TO INTERNATIONAL BOUNDARY)	AVERAGE LOAD/CAR (TONS)	AVERAGE LENGTH OF HAUL (MILES TO INTERNATIONAL BOUNDARY)	AVERAGE LOAD/CAR (TONS)
1. Products of agriculture	1976	346	50.6	192	36.2
	1977	349	55.2	188	40.6
2. Animals & animal products	1976	337	45.9	231	46.1
	1977	282	47.1	187	51.1
3. Products of mines	1976	373	83.2	195	65.2
	1977	325	83.8	209	64.5
4. Products of forests	1976	130	44.6	271	42.1
	1977	116	46.3	255	39.8
5. Manufactures and miscellaneous	1976	342	42.2	209	31.8
	1977	341	45.3	212	31.1
TOTAL ALL COMMODITIES	1976	339	45.8	206	36.3
	1977	328	48.2	210	36.8

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Carload All-Rail Traffic between Canada and United States, 1976, Reference Paper No. 3.3, Catalogue No. TT31-7/1978, ISBS: 0-660-01841-1, Minister of Supply and Services Canada, 1978; and 1977, Reference Paper No. 3.4, Catalogue No. TT31-6-1977, ISBN 0-660-50430-8, Minister of Supply and Services Canada, 1980.

TABLE 18

CARLOAD ALL-RAIL TRAFFIC BETWEEN ONTARIO AND UNITED STATES
ONTARIO ORIGINATED TRAFFIC, 1976 AND 1977

MAJOR COMMODITY GROUPS	YEAR	CARS	%	TONS	%	REVENUE (CAN.)	%	REVENUE (U.S.)	%	TON-MILES	%	CAR-MILES	%
1. Products of agriculture	1976	4,493	3.8	227,396	4.2	1,927,011	3.0	1,857,734	1.9	78,775	4.3	1,552	4.4
	1977	4,502	3.5	248,590	4.1	2,235,160	3.0	2,172,400	1.9	86,768	4.3	1,599	4.3
2. Animals & animal prdts.	1976	70	0.1	3,216	0.1	48,080	0.1	65,032	0.1	1,086	0.1	23	0.1
	1977	59	0.0	2,778	0.0	37,595	0.1	72,577	0.1	784	0.0	16	0.0
3. Products of mines	1976	9,163	7.8	762,028	14.2	7,833,365	12.0	8,590,802	8.6	284,511	15.6	3,366	9.6
	1977	8,221	6.5	689,032	11.3	6,868,086	9.4	9,465,596	8.1	224,098	11.1	2,674	7.2
4. Products of forests	1976	4,761	4.1	212,229	3.9	1,745,473	2.7	2,154,311	2.2	27,697	1.5	658	1.9
	1977	6,807	5.4	314,948	5.1	2,538,733	3.5	3,822,615	3.3	36,711	1.8	817	2.2
5. Manufactures & Misc.	1976	98,977	84.2	4,172,548	77.6	53,327,727	82.2	86,851,033	87.2	1,430,146	78.5	29,569	84.0
	1977	107,489	84.6	4,867,232	79.5	61,612,232	84.0	101,668,942	86.7	1,662,658	82.8	32,204	86.3
TOTAL	1976	117,464	100.0	5,377,417	100.0	64,881,656	100.0	99,518,912	100.0	1,822,215	100.0	35,168	100.0
	1977	127,078	100.0	6,122,580	100.0	73,291,806	100.0	117,202,130	100.0	2,011,019	100.0	37,310	100.0

NOTE: ton-miles, car-miles in 000's; Canadian revenue & American revenue in Canadian dollars.

SOURCE: Canadian Transport Commision, Traffic and Tariffs Branch, Commodity Flow Analysis Carload All-Rail Traffic between Canada and U.S. 1976, Reference Paper No. 3.3, Cat. No. TT31-7/1978, ISBS: 0-660-01841-1, Minister of Supply and Services Canada, 1978; and 1977, Reference Paper No. 3.4, Cat. No. TT31-6-1977, ISBN 0-660-50430-8, Minister of Supply and Services Canada, 1980.

TABLE 19

CARLOAD ALL-RAIL TRAFFIC BETWEEN ONTARIO AND UNITED STATES
ONTARIO TERMINATED TRAFFIC, 1976 AND 1977

MAJOR COMMODITY GROUPS	YEAR	CARS	%	TONS	%	REVENUE (CAN.)	%	REVENUE (U.S.)	%	TON-MILES	%	CAR-MILES	%
1. Products of agriculture	1976	10,032	8.0	363,291	7.8	3,139,983	5.8	23,179,177	19.3	70,033	7.3	2,002	7.7
	1977	9,424	7.9	382,561	8.7	3,706,840	6.5	25,202,989	21.2	72,010	7.8	1,870	7.6
2. Animals and animal products	1976	177	0.1	8,161	0.2	96,351	0.2	266,493	0.2	1,890	0.2	40	0.2
	1977	131	0.1	6,691	0.2	74,931	0.1	197,548	0.2	1,255	0.1	26	0.1
3. Products of mines	1976	16,471	13.1	1,075,194	23.2	5,921,591	10.9	16,450,268	13.7	210,498	21.9	3,201	12.4
	1977	16,630	13.9	1,072,655	24.4	6,714,032	11.8	18,054,781	15.2	225,166	24.3	3,342	13.5
4. Products of forests	1976	4,545	3.6	191,126	4.1	1,567,056	2.9	8,118,622	6.8	51,803	5.4	1,219	4.7
	1977	3,170	2.7	126,067	2.9	1,142,133	2.0	5,743,212	4.8	32,261	3.5	806	3.3
5. Manufactures & miscellaneous	1976	94,308	75.2	2,997,869	64.7	43,436,905	80.2	72,063,153	60.0	627,445	65.2	19,344	75.0
	1977	89,938	75.4	2,801,409	63.8	45,091,480	79.5	69,596,908	58.6	595,003	64.3	18,699	75.6
TOTAL ALL COMMODITIES	1976	125,533	100.0	4,635,641	100.0	54,161,886	100.0	120,077,713	100.0	961,669	100.0	25,806	100.0
	1977	119,293	100.0	4,389,383	100.0	56,729,416	100.0	118,795,432	100.0	925,695	100.0	24,743	100.0

NOTE: Ton-miles, car-miles in 000's; Canadian revenue & American revenue in Canadian dollars.

SOURCE: Canadian Transport Commission, Traffic and Tariffs Branch, Commodity Flow Analysis, Carload All-Rail Traffic between Canada and United States 1976, Reference Paper No. 3.3, Catalogue No. TT31-7/1978, ISBS: 0-660-01841-1, Minister of Supply and Services Canada, 1978; and 1977, Reference Paper No. 3.4, Catalogue No. TT31-6-1977, ISBN 0-660-50430-8, Minister of Supply and Services Canada, 1980.

INTRA-ONTARIO RAIL COMMODITY FLOW ANALYSIS

CARLOAD NONINTERLINE AND INTERLINE

ALL-RAIL TRAFFIC (CARS & TONNAGE) BY MAJOR COMMODITY GROUPINGS

FOR NINE CANADIAN FREIGHT TRANSPORT MODEL REGIONS

WITHIN ONTARIO, 1977, 1978 AND 1979

TABLES 20 - 31

PREFACE

The tables following these explanatory notes comprise the aggregations of Ontario intra-provincial all-rail data for the years 1977, 1978 and 1979 (Tables 20 - 31).

According to the Canadian Institute of Guided Ground Transport, Queen's University, Kingston, Ontario, the total number of railway cars and total weight of shipments by five major commodity groups (products of agriculture, animals and animal products, products of mines, products of forests and manufactured and miscellaneous, which correspond closely to the CTC commodity classifications) were summed from information provided on the rail waybills. Express and non-carload shipments are included in the "manufactured and miscellaneous" category. They are part of CFTM (Canadian Freight Transport Model) #93, Mixed Load Freight, which takes in Statistics Canada commodities 624, mixed carload freight, 626, freight forwarder and shipper associated traffic, and 640, non-carload shipments (less than carload shipments, express, etc.).

The aggregations were performed, by the Canadian Institute of Guided Transport, for traffic with origin and destination in Ontario, using modified Statistics Canada census divisions. These divisions approximate the economic regions of Ontario. Called CFTM (Canadian Freight Transport Model) regions, they constitute nine (9) regions in Ontario, specified by numbers and names.

The counties, regional municipalities and district municipalities included in these nine CFTM regions are as follows:

CFTM Region 50, Eastern Ontario

Glengarry	Leeds
Prescott	Lanark
Russel	Frontenac
Stormont	Lennox and Addington
Dundas	Hastings
Ottawa - Carleton Reg. Mun.	Prince Edward
Grenville	Renfrew

CFTM Region 51, Central/Lake Ontario

Northumberland
Peterborough
Victoria
Dufferin
Simcoe
Muskoka Distr. Mun.
Haliburton

CFTM Region 52, Toronto

Durham Reg. Mun.
York Reg. Mun.
Toronto
Peel Reg. Mun.
Halton Reg. Mun.

CFTM Region 53, Hamilton/St. Catharines

Wellington
Hamilton - Wentworth Reg. Mun.
Niagara Reg. Mun.
Haldimand - Norfolk Reg. Mun.
Brant
Waterloo Reg. Mun.

CFTM Region 54, London/Lake Erie

Oxford
Elgin
Middlesex

CFTM Region 55, Lake St. Clair

Kent Essex Lambton

CFTM Region 56, Georgian Bay

Perth
Huron
Bruce
Grey

CFTM Region 57, Sudbury/North-East Ontario

Nipissing District
Parry Sound District
Manitoulin District
Sudbury District
Sudbury Reg. Mun.
Timiskawing District
Cochrane District
Algoma District

CFTM Region 58, Lakehead/North-West Ontario

Thunder Bay District
Rainy River District
Kenora District

The data are set up as matrixes for each commodity group as well as for the total of all commodities with origin regions versus destination regions. Total data are presented for the origin rows and the destination region columns. The aggregations are also split into "noninterlined" and "interlined" categories. In this folder, odd numbered tables represent noninterline rail data and the even number tables show interline rail traffic.

In accordance with the explanatory remarks of the Canadian Institute of Guided Ground Transport, the following is worthwhile to note:

> The "interlined" group includes shipments in which interlines have been received, shipments in which interlines have been forwarded and shipments in which interlines have been both received and forwarded. They are only recorded for interlines between different railways and not for interlines between railways and other modes. Since the rail data combines waybill information obtained from CN and CP, interlines between CN and CP will be double counted. Interlines between CN or CP and other railways, for example, U.S. railways at the border, will not be double counted.
>
> To give...an estimation of the amount of double counting, the total Ontario traffic after matching CN and CP records is 29,213,439 tons in 1977 and 25,573,096 tons in 1978.

It was not possible to learn from the Canadian Institute of Guided Ground Transport why for the same type of commodity there is a large discrepancy in number of cars transporting a certain weight of shipment in tons , e.g.:

Table 26

from region 50 to 57

1977 - 4 cars: 100 tons;

1978 - 2 cars: 127 tons;

1979 - 1 car: 56 tons.

Table 27

from region 55 to 58

1977 - 4 cars: 86 tons;

1978 - 3 cars: 193 tons.

Table 28

from region 57 to 54

1977 - 6 cars: 379 tons;

1978 - 15 cars: 882 tons;

1979 - 17 cars: 1255 tons

from region 58 to 54

1977 - 16 cars: 353 tons;

1978 - 14 cars: 337 tons;

1979 - 33 cars: 726 tons.

A set of maps showing Southern and Northern Ontario is included. It displays CFTM (Canadian Freight Transport Model) regions by numbers and names.

LIST OF TABLES

TABLE 20

NONINTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, PRODUCTS OF AGRICULTURE, 1977, 1978 and 1979

REGIONS		DESTINATION																		
		50		51		52		53		54		55		56		57		58		TOTAL	
ORIGIN	YEAR	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern Ontario	1977	50	2370	8	476	484	23334	12	542	55	3198	2	119	13	559	1	41	0	0	625	30639
	1978	8	389	10	597	474	23583	45	2475	59	3378	0	0	0	0	0	0	1	88	597	30510
	1979	1	42	18	1058	356	17526	25	1474	31	1693	7	585	1	47	0	0	0	0	439	22425
51 Central - Lake Ontario	1977	1	25	359	23457	459	10859	43	1994	2	105	0	0	1	24	0	0	0	0	860	36464
	1978	2	137	214	14175	67	2657	12	284	2	97	1	35	0	0	1	15	0	0	299	17400
	1979	40	3506	238	15234	84	5041	14	852	1	43	2	183	0	0	0	0	1	100	380	24959
52 Toronto	1977	288	12416	236	18632	474	30322	14	458	6	362	233	21490	9	326	0	0	254	9013	1514	93019
	1978	184	8130	178	14252	534	31698	23	1233	7	490	172	15926	1	93	0	0	253	8725	1352	80547
	1979																				
53 Hamilton- St.Catharines	1977	17	700	56	2777	596	17305	130	3765	41	1883	0	0	77	3239	4	200	10	552	931	30421
	1978	4	196	3	139	145	5125	24	1614	8	457	1	93	23	922	0	0	3	90	211	8636
	1979	1	40	6	276	70	3177	7	237	10	422	0	0	16	640	1	50	3	80	114	4922
54 London- Lake Erie	1977	144	3802	26	426	1142	30780	202	12912	11	280	28	450	72	1267	29	437	30	543	1684	50897
	1978	137	2176	21	323	1129	31174	158	10134	36	961	32	576	75	1176	35	527	25	429	1648	47476
	1979	136	2150	18	320	1054	23607	46	694	2	89	33	574	73	1192	32	481	31	502	1425	29609
55 Lake St. Clair	1977	19	562	0	0	843	71242	37	3557	318	31927	75	7006	0	0	0	0	0	0	1292	114294
	1978	21	800	0	0	341	29058	1	86	330	29261	33	3008	0	0	0	0	1	21	727	62234
	1979	51	3145	0	0	475	37732	1	75	322	27998	94	8589	2	121	0	0	0	0	945	77660
56 Georgian Bay	1977	11	905	0	0	323	25587	108	9084	119	9579	1	90	205	16070	0	0	0	0	767	61315
	1978	2	120	0	0	323	25441	3	199	52	4449	0	0	264	20627	0	0	0	0	644	50836
	1979	0	0	1	55	245	20564	0	0	11	930	0	0	7	546	0	0	0	0	264	22095
57 Sudbury- N.E.Ontario	1977	2	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	62
	1978	1	50	0	0	0	0	0	0	0	0	0	0	0	0	3	97	0	0	4	147
	1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	109	2	109
58 Lakehead N.W.Ontario	1977	270	15868	248	16801	566	33466	94	5607	29	1474	9	547	17	1063	8	382	39	1727	1280	76935
	1978	232	13549	210	13983	509	32549	210	12713	54	3031	8	498	70	4253	3	130	15	467	1311	81173
	1979	381	22462	53	3767	691	43326	274	16371	136	9710	20	968	110	8256	4	247	30	1314	1699	106421
TOTAL	1977	802	36710	928	62569	4887	242895	640	37919	581	48808	348	29702	394	22548	42	1060	333	11835	8955	494046
	1978	591	25547	636	43469	636	181285	476	28738	548	42124	247	20136	433	27071	42	769	298	9820	6793	378959
	1979	784	38923	525	36275	3261	170492	391	20983	530	41876	369	30618	210	10879	38	804	219	7505	6327	358355

TABLE 21

INTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, PRODUCTS OF AGRICULTURE, 1977, 1978 and 1979

REGIONS		DESTINATION																			
ORIGIN	YEAR	50		51		52		53		54		55		56		57		58		TOTAL	
		CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern Ontario	1977	15	837	9	265	40	1773	0	0	0	0	0	0	0	0	0	0	0	0	64	2875
	1978	11	305	5	186	43	2417	0	0	0	0	0	0	0	0	0	0	0	0	59	2908
	1979	7	202	2	79	38	2221	0	0	0	0	3	149	0	0	0	0	0	0	50	2651
51 Central-Lake Ontario	1977	0	0	3	72	4	144	42	1578	0	0	0	0	0	0	0	0	7	280	56	2074
	1978	0	0	7	288	1	30	17	636	1	30	0	0	0	0	1	30	9	367	36	1381
	1979	0	0	11	330	6	180	13	648	0	0	0	0	0	0	1	41	7	288	38	1487
52 Toronto	1977	0	0	3	90	205	10578	90	5244	3	32	9	274	13	380	2	92	0	0	325	16690
	1978	0	0	4	161	115	5802	82	5203	0	0	12	356	44	1418	2	36	0	0	259	12976
	1979	0	0	4	144	92	4654	75	4086	0	0	15	513	68	2452	3	79	0	0	257	11928
53 Hamilton-St. Catharines	1977	22	1613	118	4742	378	17940	10	538	5	180	1	44	25	951	36	1807	1	55	596	27870
	1978	9	280	62	2952	222	8194	8	304	6	178	0	0	12	478	0	0	0	0	319	12386
	1979	0	0	67	3514	186	6967	7	408	17	1049	0	0	4	175	11	754	3	155	295	13022
54 London-Lake Erie	1977	11	845	0	0	63	5570	27	2255	0	0	0	0	1	44	26	390	1	20	129	9124
	1978	6	377	0	0	22	1139	42	3462	0	0	1	56	0	0	22	332	0	0	93	5366
	1979	8	616	2	148																
55 Lake St. Clair	1977	38	3390	25	1155	158	11953	33	2814	8	534	3	211	8	248	5	182	1	58	279	20545
	1978	4	203	32	1523	109	8929	5	136	13	1023	29	2529	1	22	2	74	2	113	197	14552
	1979	31	1731	21	1075	35	2960	10	258	9	409	2	129	1	20	4	122	1	46	114	6750
56 Georgian Bay	1977	0	0	0	0	0	0	0	0	0	0	0	0	1	34	0	0	0	0	1	34
	1978	0	0	0	0	0	0	0	0	0	0	0	0	4	184	0	0	0	0	4	184
	1979	0	0	0	0	1	31	0	0	0	0	0	0	2	64	0	0	0	0	3	95
57 Sudbury-North-East Ontario	1977	24	1293	13	621	159	9993	12	656	6	335	9	502	39	2085	5	206	0	0	267	15691
	1978	8	566	1	62	105	7738	151	7242	20	1097	15	778	79	4436	3	118	1	19	383	22056
	1979	62	4103	22	1169	118	8038	31	1939	28	1568	11	571	161	9361	140	13217	1	41	574	40012
58 Lakehead North-West Ontario	1977	22	1112	0	0	0	0	169	9027	4	206	18	758	6	424	17	299	5	201	241	12027
	1978	25	1873	3	163	8	445	116	7442	0	0	6	374	35	1890	23	552	17	721	233	13460
	1979	23	1847	18	996	5	293	418	25542	19	1008	2	200	25	1519	22	644	16	642	548	32691
TOTAL	1977	132	9090	171	6945	1007	57951	383	22112	26	1287	40	1789	93	4166	91	2976	15	614	1958	106930
	1978	63	3604	114	5335	625	34694	421	24425	40	2328	63	4093	175	8428	53	1142	29	1220	1583	85269
	1979	131	8504	147	7455	514	28398	578	33819	75	4108	33	1562	261	13591	203	15187	31	1284	1973	113908

TABLE 22

NONINTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, ANIMALS AND ANIMAL PRODUCTS, 1977,78 & 79.

REGIONS		DESTINATION																			
ORIGIN	YEAR	50		51		52		53		54		55		56		57		58		TOTAL	
		CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern	1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ontario	1978	0	0	0	0	6	306	0	0	0	0	0	0	0	0	0	0	0	0	6	306
	1979	1	31	0	0	0	0	0	0	0	0	0	0	1	52	0	0	2	37	4	120
51 Central-	1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake Ontario	1978	0	0	1	11	1	90	0	0	0	0	0	0	0	0	0	0	2	99	4	200
	1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	180	3	180
52 Toronto	1977	0	0	0	0	20	668	5	190	0	0	1	22	16	575	0	0	0	0	42	1455
	1978	0	0	0	0	10	314	5	226	0	0	0	0	4	154	0	0	0	0	19	694
	1979	0	0	0	0	7	155	7	303	0	0	0	0	11	394	0	0	0	0	25	852
53 Hamilton-	1977	1	53	0	0	1	85	0	0	0	0	0	0	0	0	0	0	0	0	2	138
St. Catharines	1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54 London-	1977	0	0	0	0	1	7	0	0	2	85	0	0	0	0	0	0	13	419	16	511
Lake Erie	1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	359	8	359
	1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	489	12	489
55 Lake	1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
St. Clair	1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56 Georgian Bay	1977	17	868	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	868
	1978	19	983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	983
	1979	24	1241	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	1241
57 Sudbury-	1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North-East	1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ontario	1979	0	0	0	0	1	X	0	0	0	0	0	0	0	0	0	0	0	0	1	X
58 Lakehead	1977	0	0	0	0	1	10	15	233	7	84	0	0	3	39	0	0	0	0	26	366
North-West	1978	0	0	0	0	1	16	5	74	4	48	1	10	0	0	0	0	0	0	11	148
Ontario	1979	0	0	0	0	0	0	0	0	2	28	0	0	0	0	0	0	0	0	2	28
TOTAL	1977	18	921	0	0	23	770	20	423	9	169	1	22	19	614	0	0	13	419	103	3338
	1978	19	983	1	11	18	726	10	300	4	48	1	10	4	154	0	0	10	458	67	2690
	1979	25	1272	0	0	8	155	7	303	2	28	0	0	12	446	0	0	17	706	71	2910

TABLE 23

INTERLINE RAIL TARAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, ANIMAL AND ANIMAL PRODUCTS, 1977,78 & 79

REGIONS		DESTINATION																			
ORIGIN	YEAR	50		51		52		53		54		55		56		57		58		TOTAL	
		CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern Ontario	1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51 Central-Lake Ontario	1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52 Toronto	1977	0	0	0	0	0	0	3	144	11	247	60	1446	68	1411	1	15	0	0	143	3263
	1978	0	0	0	0	1	31	0	0	8	134	47	1041	26	638	1	31	0	0	83	1875
	1979	0	0	0	0	3	136	1	12	0	0	47	776	25	701	0	0	0	0	76	1625
53 Hamilton St. Catharines	1977	0	0	3	124	0	0	0	0	0	0	0	0	10	405	0	0	0	0	13	529
	1978	0	0	2	88	0	0	0	0	0	0	1	79	4	176	0	0	0	0	4	172
	1979	0	0	0	0	0	0	0	0	0	0	0	0	4	172	0	0	0	0	4	172
54 London-Lake Erie	1977	0	0	0	0	38	479	0	0	0	0	0	0	0	0	14	405	0	0	14	405
	1978	0	0	0	0	1	57	0	0	0	0	0	0	1	44	6	195	0	0	8	296
	1979	0	0	0	0	0	0	0	0	1	31	0	0	0	0	10	271	0	0	11	302
55 Lake St. Clair	1977	0	0	0	0	38	479	0	0	0	0	0	0	0	0	0	0	0	0	38	479
	1978	0	0	0	0	5	60	0	0	0	0	0	0	0	0	0	0	0	0	5	60
	1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56 Georgian Bay	1977	0	0	0	0	0	0	1	22	0	0	0	0	0	0	0	0	0	0	1	22
	1978	0	0	0	0	0	0	2	44	0	0	0	0	0	0	0	0	0	0	2	44
	1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57 Sudbury North-East Ontario	1977	0	0	0	0	4	145	0	0	0	0	0	0	3	58	0	0	0	0	7	203
	1978	0	0	0	0	1	53	0	0	0	0	0	0	0	0	0	0	0	0	1	53
	1979	0	0	0	0	8	452	1	30	0	0	2	37	0	0	0	0	0	0	11	519
58 Lakehead North-West Ontario	1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1977	0	0	3	124	42	624	4	166	11	247	60	1446	81	1874	15	420	0	0	216	4901
	1978	0	0	2	88	8	201	2	44	8	134	48	1120	31	858	7	226	0	0	106	2671
	1979	0	0	0	0	11	588	2	42	1	31	49	813	29	873	10	271	0	0	102	2618

TABLE 24

NONINTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, PRODUCTS OF MINES, 1977,1978 & 1979.

REGIONS		DESTINATION																			
ORIGIN	YEAR	50		51		52		53		54		55		56		57		58		TOTAL	
		CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern Ontario	1977	10898	722700	0	0	707	67512	16	1513	0	0	0	0	0	0	0	0	17	1666	11638	793391
	1978	1727	141362	0	0	842	81824	1363	105900	1	73	0	0	0	0	64	6418	124	12123	4121	347700
	1979	1077	106036	0	0	1545	131996	7	683	0	0	0	0	0	0	4	390	86	8598	2719	247703
51 Central Lake Ontario	1977	1677	135862	0	0	20559	1666801	181	16546	2	80	0	0	1	99	327	26394	0	0	22737	1845782
	1978	1324	111930	1	68	17461	1434103	232	21335	2	80	0	0	85	8029	183	17929	0	0	19288	1593474
	1979	1054	88302	0	0	17642	1464905	222	20297	4	194	0	0	203	19191	73	5316	2	123	19200	1598328
52 Toronto	1977	181	17805	0	0	7373	569551	12	821	1140	81662	11	775	5	450	530	46125	65	3935	9317	721124
	1978	0	0	0	0	7594	662449	0	0	593	43129	0	0	1	7	617	50182	89	5643	8894	721410
	1979	14	1399	17	1494	6876	558778	2	131	669	49446	3	220	0	0	556	44875	57	2739	8194	659082
53 Hamilton St. Catharines	1977	0	0	3	131	1	38	22	1667	12	876	179	14732	269	19863	2	158	0	0	488	37465
	1978	0	0	6	220	0	0	22	2005	2	102	979	73291	123	9107	1	64	2	61	1135	84850
	1979	1	65	0	0	0	0	0	0	10	830	1468	119297	128	9947	1	59	2	147	1610	130345
54 London Lake Erie	1977	2	35	1	30	951	78326	2852	223460	1	81	0	0	0	0	580	59551	134	12103	4521	373586
	1978	0	0	0	0	1236	101550	1788	141845	1	80	0	0	1	89	310	31707	15	1458	3351	276729
	1979	0	0	0	0	1324	107000	1487	118710	6	587	0	0	0	0	117	11783	34	3406	2968	241486
55 Lake St. Clair	1977	337	33438	0	0	440	42047	1	96	0	0	0	0	330	20193	6	559	3	70	1117	96403
	1978	505	50650	0	0	421	40286	1	51	1	40	0	0	191	11614	2	183	1	24	1122	102848
	1979	536	53751	0	0	394	37960	0	0	0	0	0	0	0	0	1	83	1	101	932	91895
56 Georgian Bay	1977	354	35151	0	0	9	432	1	20	0	0	0	0	0	0	631	60934	19	1412	1014	97949
	1978	410	40760	0	0	8	365	0	0	0	0	0	0	0	0	395	38326	15	1168	828	80619
	1979	372	37045	0	0	23	2145	1	60	0	0	0	0	0	0	469	45637	6	310	871	85197
57 Sudbury North East Ontario	1977	0	0	0	0	6	121	339	23547	0	0	0	0	0	0	112614	8805487	43	4201	113002	8833356
	1978	0	0	0	0	11	919	518	40012	0	0	0	0	0	0	73117	5692937	5	493	73651	5734361
	1979	0	0	0	0	1	31	1137	92586	0	0	0	0	0	0	38269	3050501	0	0	39407	3143118
58 Lakehead North West Ontario	1977	0	0	0	0	1	70	0	0	0	0	0	0	0	0	1930	144672	67056	4891525	68987	5036267
	1978	0	0	0	0	0	0	0	0	0	0	2	203	0	0	915	68192	66491	4851194	67408	4920189
	1979	0	0	3	254	1	5	0	0	0	0	0	0	0	0	539	41537	57327	4211795	57870	4253591
TOTAL	1977	13439	944991	4	161	30047	2424898	3424	267670	1155	82699	190	15507	605	40605	116620	9143880	67337	4914912	232821	17835323
	1978	3966	344702	7	288	27573	2281496	3924	311148	600	43504	981	73494	401	28846	75604	5905938	66742	4872764	179798	13862180
	1979	3054	286598	20	1748	27806	2302820	2856	232467	689	51057	1471	119517	331	29138	40029	3200181	57515	4227219	133771	10450745

TABLE 25

INTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, PRODUCTS OF MINES, 1977, 1978 and 1979

REGIONS		DESTINATION																			
ORIGIN	YEAR	50		51		52		53		54		55		56		57		58		TOTAL	
		CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern Ontario	1977	45	4308	0	0	0	0	0	0	0	0	0	0	0	0	134	13275	0	0	179	17583
	1978	85	8019	0	0	74	7487	0	0	0	0	1	29	0	0	141	13436	0	0	301	28971
	1979	50	4667	0	0	0	0	2	171	1	61	0	0	0	0	209	19987	0	0	262	24886
51 Central-Lake Ontario	1977	0	0	0	0	0	0	1607	118730	99	8323	338	30282	0	0	101	10142	0	0	2145	167477
	1978	0	0	0	0	0	0	1615	119241	41	3086	304	27793	0	0	31	3134	20	1551	2011	154805
	1979	0	0	0	0	0	0	1564	117237	47	3546	251	22203	0	0	39	3351	0	0	1901	146337
52 Toronto	1977	0	0	0	0	27	1318	2	75	2	195	0	0	1	78	19	1653	0	0	51	3319
	1978	0	0	2	185	27	1369	77	7607	0	0	1	102	0	0	114	11319	0	0	221	20582
	1979	0	0	0	0	41	3556	5	361	0	0	0	0	0	0	132	13425	0	0	178	17342
53 Hamilton-St. Catharines	1977	34	2199	18	944	277	13489	105	6141	3	124	2	81	11	657	256	18291	1	60	707	41986
	1978	13	726	17	928	335	17227	89	5611	0	0	0	0	13	781	249	16226	1	100	717	41599
	1979	9	584	12	646	294	19175	110	7572	1	76	0	0	12	779	317	20954	11	467	766	50253
54 London-Lake Erie	1977	0	0	1	50	1	30	9	598	444	45154	16	1537	0	0	19	1495	0	0	490	48864
	1978	0	0	1	49	11	634	22	1849	402	41387	12	1067	0	0	7	508	1	100	456	45594
	1979	0	0	1	55	30	2455	12	779	370	35936	29	2778	2	116	30	2857	4	400	478	45376
55 Lake St. Clair	1977	0	0	4	130	6	284	5	239	1	30	2	200	10	650	87	8107	0	0	115	9640
	1978	6	364	7	165	21	816	12	677	1	64	1	100	7	564	2	128	1	99	58	2977
	1979	27	1783	5	176	69	3035	29	1649	2	95	0	0	10	927	16	1470	1	56	159	9191
56 Georgian Bay	1977	0	0	0	0	0	0	0	0	1	42	0	0	0	0	35	3352	0	0	36	3394
	1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	3792	0	0	38	3792
	1979	0	0	0	0	0	0	0	0	2	204	0	0	0	0	56	5309	0	0	58	5513
57 Sudbury-North-East Ontario	1977	25	2287	43	3999	25	1769	27347	2635240	138	12013	15	1452	70	6304	747	59888	0	0	28410	2722952
	1978	76	6910	52	4904	32	2583	27627	2705619	181	17050	14	1389	100	9004	413	35729	0	0	28495	2783188
	1979	56	5080	59	5347	28	2073	25091	2462577	63	5598	18	1697	58	5065	871	78374	3	176	26247	2565987
58 Lakehead North-West Ontario	1977	0	0	10	731	0	0	54	4430	0	0	39	3296	0	0	1946	163776	4	309	2053	172542
	1978	0	0	4	313	0	0	1	83	0	0	0	0	0	0	1287	119924	119	9751	1411	130071
	1979	0	0	0	0	0	0	1	101	0	0	0	0	0	0	1587	147520	51	4153	1639	151774
TOTAL	1977	104	8794	76	5854	336	16890	29129	2765453	688	65881	412	36848	92	7689	3344	279979	5	369	34186	3187757
	1978	180	16019	83	6544	500	30116	29443	2840687	625	61587	333	30480	120	10349	2282	204196	142	11601	33708	3211579
	1979	142	12114	77	6224	462	30294	26814	2590447	486	45516	298	26678	82	6887	3257	293247	70	5252	31688	3016659

TABLE 26

NONINTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN - DESTINATION MATRIX BY COMMODITY GROUPS, PRODUCTS OF FORESTS, 1977,78 & 1979

REGIONS		DESTINATION																			
ORIGIN	YEAR	50		51		52		53		54		55		56		57		58		TOTAL	
		CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern Ontario	1977	1	57	5	177	19	1037	2	153	0	0	2	91	0	0	4	100	5	109	38	1724
	1978	2	105	2	88	53	2462	3	215	0	0	0	0	0	0	2	127	35	1457	97	4454
	1979	2	72	0	0	27	1149	4	137	0	0	0	0	0	0	1	56	45	2375	79	3789
51 Central-Lake Ontario	1977	50	1250	0	0	14	478	191	13812	0	0	0	0	11	500	1	18	1	11	268	16069
	1978	22	550	1	63	8	327	280	20547	0	0	0	0	10	481	1	9	538	331		22524
	1979	0	0	0	0	1	290	219	15480	2	101	0	0	12	565	0	0	0	0	239	16436
52 Toronto	1977	222	7501	1	10	24	842	95	6318	0	0	3	147	0	0	0	0	1	44	346	14862
	1978	326	9528	1	40	16	542	2	46	0	0	1	60	0	0	0	0	19	276	365	10492
	1979	346	10070	2	61	42	1296	68	4897	3	166	1	44	0	0	0	0	16	226	478	16760
53 Hamilton-St. Catharines	1977	2	102	0	0	1	25	1	45	1	25	0	0	0	0	0	0	2	120	7	317
	1978	0	0	0	0	0	0	4	235	1	49	0	0	0	0	0	0	6	360	11	644
	1979	0	0	0	0	4	134	4	176	0	0	0	0	0	0	0	0	7	366	15	676
54 London Lake Erie	1977	0	0	1	30	0	0	0	0	5	186	0	0	0	0	0	0	0	0	6	216
	1978	0	0	0	0	1	31	0	0	2	104	0	0	0	0	0	0	0	0	3	135
	1979	0	0	0	0	5	106	0	0	2	75	0	0	0	0	0	0	2	24	9	205
55 Lake St. Clair	1977	0	0	0	0	4	109	0	0	0	0	1	40	0	0	0	41	0	0	6	190
	1978	0	0	0	0	4	132	0	0	0	0	0	0	0	0	0	0	0	0	4	132
	1979	0	0	0	0	5	365	0	0	3	95	0	0	0	0	0	0	0	0	8	460
56 Georgian Bay	1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	75	3	75
	1979	0	0	0	0	0	0	0	0	1	52	0	0	0	0	1	31	0	0	2	83
57 Sudbury-North East Ontario	1977	475	33099	8	517	295	17404	1852	137860	11	611	264	12866	16	718	7077	463088	10731	376481	20729	1042644
	1978	441	30530	7	443	266	16303	2585	192581	5	337	252	12849	14	840	6758	443152	11696	413736	22024	1110771
	1979	221	15367	5	344	295	17620	2945	212219	10	576	145	7851	17	989	6778	452523	11024	380377	21440	1087866
58 Lakehead North-West Ontario	1977	325	12985	120	5394	2262	87115	2850	193810	233	11671	1155	50378	403	16990	132	6143	29188	1779492	36668	2163978
	1978	449	21497	183	8224	2693	105876	2438	160544	256	11963	1531	67211	518	22774	314	14435	30839	1887246	39221	2299770
	1979	582	29281	227	10930	3636	139769	2770	170049	255	12764	1633	71976	655	28791	149	7565	30816	1911572	40723	2382697
TOTAL	1977	1075	54994	135	6128	2619	107010	4991	351998	250	12493	1425	63522	430	18208	7215	469390	39928	2156257	58068	3240000
	1978	1240	62210	194	8858	3041	125673	5312	374168	264	12453	1784	80120	542	24095	7075	457732	42607	2303688	62059	3448997
	1979	1151	54790	234	11335	4020	160729	6010	402958	276	13829	1779	79871	684	30345	6929	460175	41910	2294940	62993	3508972

TABLE 27

INTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, PRODUCTS OF FORESTS,1977,78 & 1979.

REGIONS		DESTINATION																			
ORIGIN	YEAR	50		51		52		53		54		55		56		57		58		TOTAL	
		CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern Ontario	1977	74	4160	0	0	51	2664	232	10799	2	85	7	336	0	0	1	49	0	0	367	18093
	1978	21	953	1	50	49	2388	290	12984	1	43	4	214	0	0	14	959	1	80	381	17671
	1979	9	509	5	300	20	1158	271	12519	2	111	0	0	0	0	61	4098	0	0	368	18695
51 Central-Lake Ontario	1977	0	0	1	31	1	36	1	11	0	0	0	0	0	0	29	1611	0	0	32	1689
	1978	0	0	1	25	0	0	0	0	0	0	0	0	0	0	19	1342	0	0	20	1367
	1979	0	0	0	0	0	0	2	84	0	0	0	0	0	0	5	279	0	0	7	363
52 Toronto	1977	1	34	2	34	550	24866	143	8374	12	716	4	209	1	59	5	202	0	0	718	34494
	1978	0	0	1	45	448	20666	96	5528	21	1437	10	618	1	62	4	213	0	0	581	28569
	1979	0	0	2	90	261	11589	240	14093	7	445	5	198	10	506	2	86	1	61	528	27068
53 Hamilton St. Catharines	1977	6	293	17	503	160	5906	24	1095	5	159	1	37	22	1180	2	81	0	0	237	9254
	1978	1	26	9	173	119	5058	10	435	5	180	0	0	27	1413	4	135	1	25	176	7445
	1979	5	280	11	299	245	7477	14	777	0	0	1	56	15	868	2	29	2	55	295	9841
54 London-Lake Erie	1977	0	0	0	0	3	73	1	38	3	139	17	1046	1	45	0	0	0	0	25	1341
	1978	1	19	2	60	10	324	3	130	3	290	33	2025	3	92	0	0	7	332	62	3272
	1979	0	0	0	0	5	194	4	162	10	287	1	30	0	0	0	0	1	6	21	679
55 Lake St. Clair	1977	2	103	0	0	10	395	2	110	0	0	12	522	4	200	2	116	4	86	36	1532
	1978	1	60	1	30	14	636	1	44	1	34	4	187	3	125	4	101	3	193	32	1410
	1979	4	140	1	33	11	514	1	69	1	71	2	99	9	357	0	0	0	0	29	1283
56 Georgian Bay	1977	0	0	0	0	0	0	0	0	0	0	0	0	6	210	0	0	0	0	6	210
	1978	0	0	0	0	1	35	1	41	0	0	0	0	1	40	0	0	0	0	3	116
	1979	0	0	0	0	0	0	0	0	0	0	0	0	3	113	0	0	0	0	3	113
57 Sudbury-North East Ontario	1977	234	12632	663	39006	1784	83467	6232	380543	932	57221	1834	95513	151	6644	2456	133214	845	31115	15131	836355
	1978	166	7830	470	27675	1546	78663	5835	370366	877	53559	1763	91309	132	7184	2432	134525	826	28210	14047	799321
	1979	116	5697	428	25337	1469	77475	5433	349637	1012	63626	1816	96779	85	4622	1562	89252	547	18854	12468	731279
58 Lakehead North-West Ontario	1977	5	150	0	0	71	4025	1444	89770	330	21139	546	33814	0	0	1213	72220	3002	201406	6611	422524
	1978	9	527	0	0	62	3458	1407	87221	374	23745	721	43834	5	238	643	38016	6523	477662	9744	674701
	1979	10	594	1	53	175	10606	1397	88261	559	35055	815	51433	0	0	1457	89149	11316	853092	15730	1128243
TOTAL	1977	322	17372	683	39574	2630	121432	8079	490740	1284	79459	2421	128477	185	8338	3708	207493	3851	232607	23163	1325492
	1978	199	9415	485	28058	2249	111228	7643	476749	1282	79288	2535	138187	172	9154	3120	175291	7361	506502	25046	1533872
	1979	144	7220	448	26112	2186	109013	7362	465602	1591	99595	2640	148595	122	6466	3089	182893	11867	872068	29449	1917564

TABLE 28

NONINTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, MANUFACTURED AND MISCELLANEOUS,77,78 & 1979

REGIONS		DESTINATION																			
ORIGIN	YEAR	50		51		52		53		54		55		56		57		58		TOTAL	
		CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern Ontario	1977	1165	92680	33	1000	916	32038	233	10197	6	147	114	4332	11	398	157	9920	191	8925	2826	159637
	1978	1263	104167	40	2079	1017	45006	319	21365	0	0	129	5118	39	1400	118	8710	234	9979	3159	197824
	1979	1421	113940	55	2657	792	26513	259	17193	9	91	131	6797	20	656	113	8396	107	3103	2907	179346
51 Central Lake Ontario	1977	20	2005	1	80	673	31962	242	22036	9	758	5	255	20	1020	18	694	26	597	1014	59407
	1978	8	381	0	0	873	31513	326	28855	9	816	8	282	2	120	2	167	13	358	1241	62492
	1979	7	216	1	8	763	35911	322	280144	8	542	5	260	8	565	5	186	10	289	1129	66021
52 Toronto	1977	2052	67552	364	23388	5099	225436	2180	72866	627	5315	2488	46256	64	3650	3070	189683	2328	46980	18272	681126
	1978	1759	61353	400	26788	5005	247236	1834	64353	903	3660	2147	44494	44	1710	2136	132848	2622	55818	16850	638260
	1979	1551	44853	367	24533	5059	240142	2069	64030	948	3991	1717	37801	36	2165	2421	152552	2071	38912	16234	609079
53 Hamilton St. Catharines	1977	415	27352	97	5860	2150	74652	2120	144918	99	6880	1629	124459	168	12010	244	14481	216	7493	7138	418105
	1978	758	53223	83	5596	1832	93832	2733	186692	120	7660	1365	98994	190	12743	82	5886	175	5723	7338	470349
	1979	833	54709	323	13707	1699	81375	2313	162587	71	4428	774	49660	191	12724	178	12773	160	5971	6542	397934
54 London-Lake Erie	1977	74	6245	4	113	485	7601	1103	77781	41	1418	216	5645	2	37	520	42274	109	5219	2554	146333
	1978	87	7139	4	103	361	6255	983	72411	74	5131	152	1517	3	58	592	47945	58	1446	2314	142005
	1979	81	6436	2	44	309	8058	1085	77925	61	5018	40	1881	0	0	623	49768	98	3557	2299	152687
55 Lake St. Clair	1977	2341	172182	448	25185	6145	284416	2222	132674	334	20780	267	9750	2854	241881	661	37083	453	11357	15725	935308
	1978	2583	185654	467	26419	7257	350397	2563	158327	266	20592	271	4983	2478	173320	560	37365	418	9042	16863	966099
	1979	3725	280635	383	22639	6013	344386	2381	162781	241	20353	314	10986	778	58691	1573	129827	517	9962	15925	1040260
56 Georgian Bay	1977	7	346	2	42	606	10921	258	13088	0	0	243	5005	3	502	8	358	30	549	1154	30811
	1978	8	559	0	0	1608	26817	283	14252	0	0	4	46	23	643	6	231	54	1340	1986	43888
	1979	11	605	0	0	1691	27759	180	9006	1	26	39	474	5	100	1	71	33	594	1961	38633
57 Sudbury North East Ontario	1977	572	36027	4	82	2190	156366	1017	60605	6	379	1094	101875	52	1621	1726	102246	546	39640	7207	499341
	1978	403	24832	7	352	2802	208547	842	63111	15	882	863	90488	159	11501	1435	91047	412	21873	6938	512633
	1979	204	12510	1	53	2771	195124	527	39053	17	1255	612	55023	118	8638	869	54581	483	21632	5602	387869
58 Lakehead North West Ontario	1977	95	2125	4	122	1396	30092	27	872	16	353	41	541	4	203	50	1765	888	57417	2517	93490
	1978	80	1971	1	0	1481	31845	30	753	14	337	39	453	3	76	44	1367	951	64020	2643	100822
	1979	55	1225	1	26	1365	30446	81	2172	33	726	54	780	4	195	50	1939	1428	80692	3071	118201
TOTAL	1977	6741	406514	957	55872	19657	853484	9402	535037	1138	36030	6097	298118	3178	261322	6454	339004	4783	178177	58407	3023558
	1978	6949	439279	1002	61337	22236	1041448	9913	610119	1401	39078	4978	246375	2941	201571	4975	325566	4937	169599	59332	3134372
	1979	7888	515129	1133	63667	20462	989812	9217	562791	1384	36430	3868	163662	1160	83734	5833	410093	4907	164712	55670	2990030

TABLE 29

INTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO-DESTINATION MATRIX BY COMMODITY GROUPS, MANUFACTURED AND MISCELLANEOUS, 77, 78 & 1979.

REGIONS		DESTINATION																			
ORIGIN	YEAR	50		51		52		53		54		55		56		57		58		TOTAL	
		CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern	1977	157	9488	11	229	4	106	5	253	0	0	11	561	0	0	173	6610	0	0	361	17247
Ontario	1978	59	3922	8	180	51	753	1	34	0	0	5	178	0	0	148	5816	1	38	273	10921
	1979	76	5227	14	281	10	150	8	484	0	0	0	0	0	0	136	6202	3	113	247	
51 Central-	1977	0	0	1	60	6	242	360	32100	7	387	79	5723	0	0	9	214	0	0	462	38726
Lake Ontario	1978	0	0	0	0	3	160	400	35881	0	0	62	5027	0	0	1	15	9	108	475	41191
	1979	2	64	11	330	7	181	2070	159454	47	3546	303	26341	0	0	47	3730	8	306	2495	193952
52 Toronto	1977	60	3697	26	1848	710	15567	834	33902	83	1137	551	21508	11	497	2810	184212	23	767	5108	263135
	1978	20	1106	69	6856	564	12076	658	29005	20	453	756	27682	0	0	2471	163259	37	976	4624	241413
	1979	5	422	179	14183	845	32376	846	44577	26	1007	638	22883	104	3685	2921	799417	23	560	5587	319060
53 Hamilton	1977	164	8272	[illegible]	1698	1368	55650	621	16015	61	1740	920	60539	26	1232	801	54683	30	1403	4032	201232
St. Catharines	1978	132	8958	49	2224	1741	83617	573	18621	88	2762	1014	69712	34	1501	771	54307	32	1036	4434	242738
	1979	129	9453	55	2703	1575	64761	561	16493	80	3907	966	66915	56	2547	924	70651	22	794	4370	238224
54 London-	1977	0	0	101	6171	214	10930	1361	78760	132	4758	133	3793	5	205	87	7561	4	154	2037	112287
Lake Erie	1978	5	173	14	745	183	9062	1580	81141	92	2499	44	975	3	175	94	7546	1	4	2016	102320
	1979	5	45	0	0	112	4370	1932	107214	70	1415	56	1873	2	109	127	10157	0	0	2304	125183
55 Lake	1977	449	32742	172	13504	7374	252876	666	42585	510	22832	88	3455	114	5174	1357	102748	608	44990	11338	520906
St. Clair	1978	272	17002	164	13564	6714	218400	736	43459	318	12627	33	1423	122	5335	1338	110787	569	37872	10266	460470
	1979	437	28052	153	13382	6585	224752	1259	72558	227	8945	33	1496	183	9160	1451	115926	669	42378	10997	516649
56 Georgian Bay	1977	0	0	5	345	0	0	5	236	2	29	4	141	1	25	10	343	0	0	27	1119
	1978	1	10	5	397	1	50	7	505	0	0	3	134	0	0	10	428	1	15	28	1539
	1979	0	0	3	241	1	87	1	73	0	0	2	171	1	23	5	84	6	110	19	789
57 Sudbury	1977	114	7271	59	4245	1472	74223	4113	286142	91	5479	2799	140914	427	23658	3031	233035	91	3856	12197	778823
North-East	1978	93	5485	62	3995	1812	99170	4044	309261	110	6531	1461	104966	373	27282	2967	233255	149	8314	11071	798259
Ontario	1979	85	5174	131	8827	1915	99661	4302	371533	113	6842	1628	151413	206	15238	2090	141471	282	17643	10752	817802
58 Lakehead	1977	0	0	0	0	4	205	4	186	15	765	7	484	0	0	10	561	77	3149	117	5350
North-West	1978	3	153	0	0	19	978	4	286	11	561	4	249	0	0	12	652	70	2701	124	5580
Ontario	1979	0	0	0	0	0	0	5	319	2	110	1	64	0	0	11	572	94	5057	113	6122
	1977	944	61470	416	28100	11152	409799	7969	490179	901	37127	4592	231118	584	30791	8288	589922	833	54319	35679	1938825
TOTAL	1978	585	36810	391	27961	11088	424266	8004	518193	639	25433	3391	210346	532	34293	7812	576065	869	51064	33311	1904431
	1979	739	48437	529	39333	10647	406223	9084	636184	511	21781	3309	247466	451	27102	7530	530949	1099	66612	33899	2024088

- 41 -

TABLE 30

NONINTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, TOTAL OF ALL PRODUCTS, 1977, 1978 & 1979

REGIONS		DESTINATION																			
ORIGIN	YEAR	50		51		52		53		54		55		56		57		58		Total	
		CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS	CARS	TONS
50 Eastern Ontario	1977	12114	817807	46	1653	2126	123921	263	12405	61	3345	118	4542	24	957	162	10061	213	10700	15127	985391
	1978	3000	246023	52	2764	2392	153181	1730	129955	60	3451	129	5118	39	1400	184	15255	394	23647	7980	580794
	1979	2502	220121	73	3715	2720	177184	295	19487	40	1784	138	7382	22	755	118	8842	240	14113	6148	453383
51 Central-Lake Ontario	1977	1738	139142	355	23537	21705	1710100	657	54388	13	943	5	255	33	1643	346	27106	27	608	24879	1957722
	1978	1356	112998	217	14317	18410	1468698	850	71021	13	993	9	317	97	8630	187	18129	24	995	21163	1696090
	1979	1101	92024	239	15242	18495	1506147	777	64673	15	880	7	443	223	20321	78	5502	16	692	20951	1705924
52 Toronto	1977	2743	105274	601	42030	12990	826819	2306	80653	1773	87339	2736	68690	94	5001	3600	235808	2648	59972	29491	1511586
	1978	2269	79011	579	41080	13159	902239	1864	65858	1503	47279	2320	60480	50	1964	2753	183030	2983	70462	27480	1451403
	1979	2085	63900	577	41653	12270	819990	2170	70641	1632	54594	1934	57784	48	2636	2978	197453	2296	47277	25990	1355928
53 Hamilton-St. Catharines	1977	435	28207	156	8768	2749	92105	2273	150395	153	9664	1808	139191	514	35712	250	14839	228	8165	8566	486446
	1978	762	53419	92	5955	1977	98957	2783	190546	131	8268	2345	172378	336	22772	83	5950	186	6234	8695	564479
	1979	835	57814	329	13983	1773	84686	2324	163000	91	5680	2242	168957	335	23311	180	23311	172	6564	8281	533877
54 London-Lake Erie	1977	220	10082	32	599	2579	116714	4157	314153	60	2050	244	6095	74	1304	1129	102262	286	18284	8781	571543
	1978	224	9315	25	426	2727	139010	2929	224390	113	6276	184	2093	79	1323	937	80179	106	3692	7324	466704
	1979	217	8586	20	364	2692	138771	2618	197329	71	5769	73	2455	73	1192	772	62032	177	7978	6713	424476
55 Lake St. Clair	1977	2697	206182	448	25185	7432	397814	2260	136327	652	52707	343	16796	3184	262074	668	37683	456	11427	18140	1146195
	1978	3109	237104	467	26419	8023	419873	2565	158464	597	49893	304	7991	2669	184934	562	37548	420	9087	18716	131313
	1979	4312	337531	383	22639	6887	420443	2382	162856	566	48446	408	19575	780	58812	1574	129910	518	10063	17810	1210875
56 Georgian Bay	1977	389	37270	2	42	935	36940	367	22192	119	9579	244	5095	208	16572	639	61292	49	1961	2952	190943
	1978	439	42422	0	0	1939	52623	286	14451	52	4449	4	46	287	21270	401	38557	72	2583	3480	176401
	1979	407	38891	1	55	1959	50466	181	9066	13	1008	39	474	12	646	471	45739	39	904	3122	147249
57 Sudbury-North-East Ontario	1977	1049	69188	12	599	2491	173891	3208	222012	17	990	1358	114741	68	2339	121417	9371321	11320	420322	140940	10375403
	1978	845	55412	14	795	3079	225769	3945	295704	20	1219	1115	103337	173	12341	81313	6227233	12113	436102	102617	7357912
	1979	425	27877	6	397	3068	212775	4609	343858	27	1831	757	62874	135	9627	45916	3557605	11509	402118	66452	4618962
58 Lakehead North-West Ontario	1977	690	30978	372	22317	4226	150753	2986	200522	285	13582	1205	51466	427	18295	2120	152962	97167	6730161	109478	7371036
	1978	761	37017	394	22207	4684	170286	2683	174084	328	15379	1581	68375	591	27103	1276	84124	98296	6803527	110594	7402102
	1979	1018	52968	284	14977	5693	213546	3125	188592	426	23228	1707	73724	769	37242	742	51288	89601	6205373	103365	6860938
TOTAL	1977	22075	1444130	2024	124730	57233	3629057	18477	1193047	3133	180199	8061	406871	4626	343297	130331	10013334	112394	7261600	358354	24596265
	1978	12765	872721	1840	113963	56390	3630628	19635	1324473	2817	137207	7991	420135	4321	281737	87696	6690005	114594	7356329	308049	20827198
	1979	12902	896712	1912	113025	55557	3624008	18481	1219502	2881	143220	7305	393668	2397	154542	52829	4071253	104568	6695082	258832	17311012

42

TABLE 31

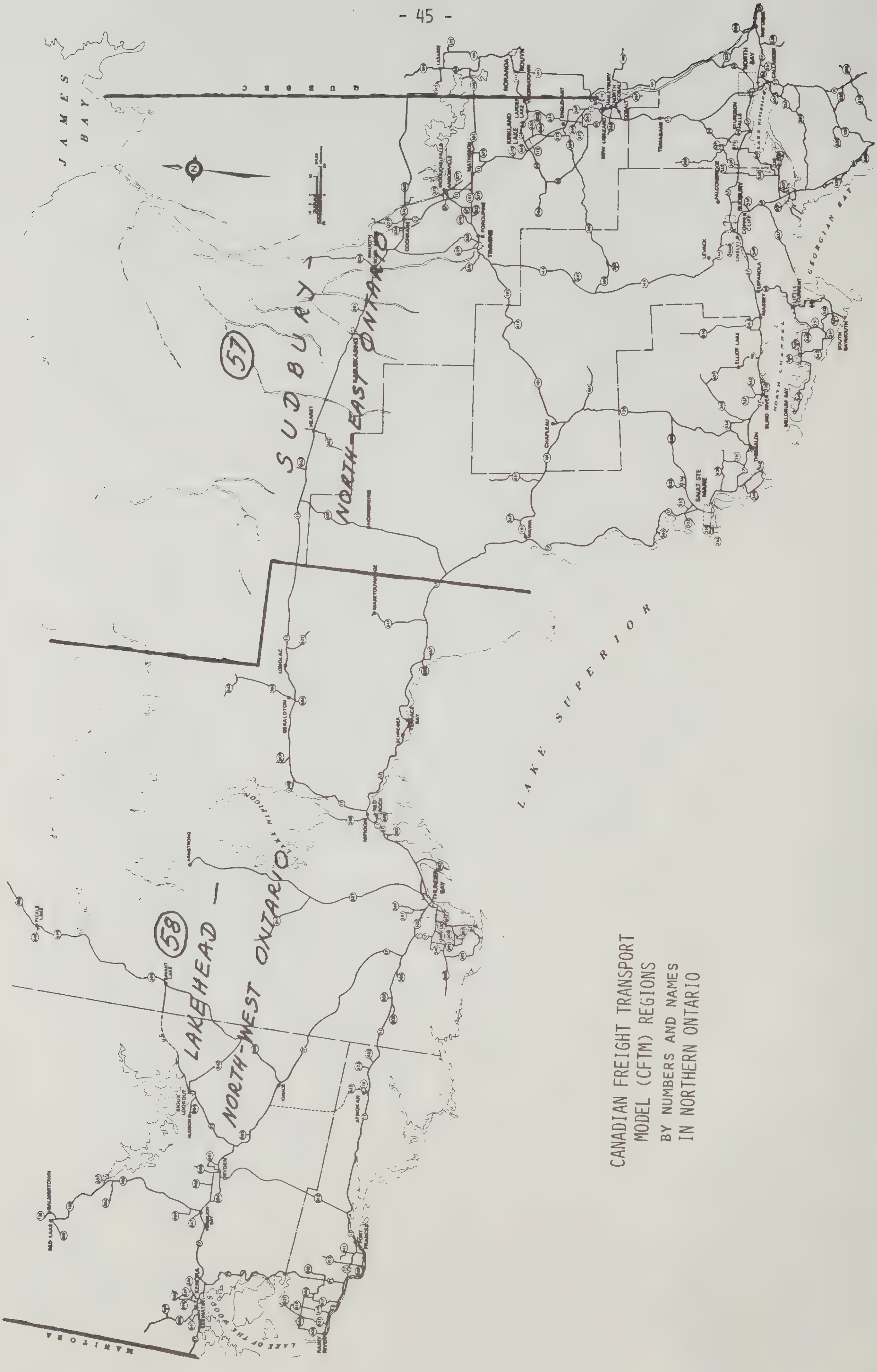
INTERLINE RAIL TRAFFIC, COMMODITY FLOW ANALYSIS - ONTARIO ORIGIN-DESTINATION MATRIX BY COMMODITY GROUPS, TOTAL OF ALL PRODUCTS

1977, 1978 & 1979

REGIONS ORIGIN	YEAR	DESTINATION 50 CARS	50 TONS	51 CARS	51 TONS	52 CARS	52 TONS	53 CARS	53 TONS	54 CARS	54 TONS	55 CARS	55 TONS	56 CARS	56 TONS	57 CARS	57 TONS	58 CARS	58 TONS	Total CARS	Total TONS
50 Eastern Ontario	1977	291	18793	20	494	95	4543	237	11052	2	85	18	897	0	0	308	19934	0	0	971	55798
	1978	176	13199	14	416	217	13045	291	13018	1	43	10	421	0	0	303	20211	2	118	1014	60471
	1979	142	10605	21	660	68	3529	281	13174	3	172	3	149	0	0	406	30287	3	113	927	58689
51 Central-Lake Ontario	1977	0	0	5	163	11	422	2010	152419	106	8710	417	36005	0	0	139	11967	7	280	2695	209966
	1978	0	0	8	313	4	190	2032	155758	42	3116	366	32820	0	0	52	4521	38	2026	2542	198744
	1979	2	64	11	330	7	181	2070	159454	47	3546	303	26341	0	0	47	3730	8	306	2495	193952
52 Toronto	1977	61	3731	31	1972	1492	52329	1072	47739	111	2327	624	23437	94	2425	2837	186174	23	767	6345	320901
	1978	20	1106	96	7247	1155	39944	913	47343	49	2024	835	29799	71	2118	2592	174858	37	976	5768	305415
	1979	5	422	179	14133	845	32376	846	44577	26	1007	638	22883	104	3685	2921	199417	23	560	5587	319060
53 Hamilton-St. Catharines	1977	226	12377	197	8011	2183	92985	760	23789	74	2203	924	60701	94	4425	1095	74862	32	1518	5585	280871
	1978	155	9990	139	6365	2417	114096	680	24971	99	3120	1015	69791	90	4349	1024	70668	34	1161	5653	304511
	1979	143	10317	145	7162	2300	98380	692	25250	98	5032	967	66971	93	4541	1254	92388	38	1471	5730	311512
54 London-Lake Erie	1977	11	845	102	6221	281	16603	1398	81651	579	50051	166	6376	7	294	146	9806	5	174	2695	172021
	1978	12	569	17	854	227	11216	1647	86582	497	44176	90	4123	7	311	129	8581	9	436	2635	156848
	1979	13	661	3	203	180	10073	1972	109093	453	37743	86	4681	4	225	189	13615	8	518	2908	176812
55 Lake St. Clair	1977	489	36235	201	14789	7586	265987	706	45748	519	23396	105	4388	136	6272	1451	111153	613	45134	11806	553102
	1978	283	17630	204	15282	6863	228841	754	44316	333	13748	67	4239	133	6046	1346	111090	575	38277	10558	479469
	1979	499	31706	180	14666	6700	231261	1299	74534	239	9520	37	1724	203	10464	1471	117518	671	42480	11299	533873
56 Georgian Bay	1977	0	0	5	345	0	0	6	258	3	71	4	141	8	269	45	3695	0	0	71	4779
	1978	1	10	5	397	2	85	10	590	0	0	3	134	5	224	48	4220	1	15	75	5675
	1979	0	0	3	241	2	118	1	73	2	204	2	171	6	200	61	5393	6	110	83	6510
57 Sudbury-North-East Ontario	1977	397	23483	778	47871	3444	169597	37704	3302581	1167	75048	4657	235381	690	38749	6239	426343	936	34971	56012	4354024
	1978	343	20791	585	36636	3496	188207	37657	3392488	1188	78237	3253	198442	684	47906	5815	403627	976	36543	53997	4402877
	1979	319	20059	640	40680	3538	187699	34858	3185716	1216	77634	3475	250497	510	34286	4663	322314	833	36714	50052	4155599
58 Lakehead North-West Ontario	1977	27	1262	10	731	75	4230	1671	103413	349	22110	610	38352	6	424	3186	236856	3088	205065	9022	612443
	1978	37	2553	7	476	89	4881	1529	95032	385	24306	731	44457	40	2128	1965	159144	6729	490835	11512	823812
	1979	33	2441	19	1049	180	10899	1821	114223	580	36173	818	51697	25	1519	3077	237885	11477	862244	18030	1318830
TOTAL	1977	1502	96726	1349	80597	15167	606696	45564	3768650	2910	184001	7525	405678	1035	52858	15896	1080790	4704	287909	95202	6563905
	1978	1027	65848	1075	67986	14470	600505	45513	3860098	2594	168770	6370	384226	1030	63082	13274	956920	8401	570387	93754	6737822
	1979	1156	76275	1201	79124	13820	574516	43840	3726094	2664	171031	6329	425114	945	54920	14089	1022547	13067	945216	97111	7074837

CANADIAN FREIGHT TRANSPORT
MODEL (CFTM) REGIONS
BY NUMBERS AND NAMES
IN SOUTHERN ONTARIO

- 45 -



CANADIAN FREIGHT TRANSPORT
MODEL (CFTM) REGIONS
BY NUMBERS AND NAMES
IN NORTHERN ONTARIO

SAFETY

SYSTEM SAFETY OVERVIEW

RAIL TRANSPORTATION

JULY 1980

MINISTRY OF TRANSPORTATION
AND COMMUNICATIONS

DANGEROUS GOODS
TRANSPORTATION OFFICE

PETER D. NOLL
PROJECT OFFICER

INDEX

SYSTEM SAFETY OVERVIEW
RAIL TRANSPORTATION
(1980)

Appendix "G"; Canadian Railway Labour Association Submission Rail Accident Inquiry, February 1980

Submission, Brotherhood of Locomotive Engineers
Submission, Brotherhood of Maintenance of Way Employees
Submission, Brotherhood of Railroad Signalmen
Submission, Brotherhood of Railway Carmen of the United States and Canada

Appendix "H"; J. Lukasiewicz, An Assessment of Canadian Railways' Safety

Appendix "I"; An Act to promote public safety in the transportation of dangerous goods

Appendix "J"; An Act to implement the International Convention for Safe Containers.

Exectuive Summary

Jurisdiction of the Canadian Transport Commission has been reviewed to determine the extent of duties and powers.

- It is found that adequate powers to administer the railway transportation system have been delegated to the Canadian Transport Commission and the Railway Transport Committee.

The structure and organization of the Canadian Transport Commission and Rail Transport Committee have been reviewed.

- Problems have been identified:

The measures undertaken by the regulatory body in response to the 1970 Inquiry into Rail Safety, have not been substantially effective in improving the level of public safety in line with reasonable expectations.

The regulatory body's low-key profile in using its extensive powers affirmatively, seems to result in slow progress in improving the level of public safety.

The regulatory body's extensive reliance on self-regulation by the railway companies does not seem to have produced substantial improvements in the level of public safety, in line with reasonable expectations.

The regulatory body's response to the aging of the technology employed in the Canadian railway infrastructure and rolling stock, does not seem to provide adequate and timely compensating measures to maintain a level of public safety in line with reasonable expectations.

The regulatory body seems to be slow in assessing opportunities for constructive changes to the rail transportation system which may result from technological innovations. Its level of response to such opportunities does not seem to actively encourage substantial and timely upgrading of the rail transportation environment, to achieve improved public safety.

Substantial work seems still to be required (some of it in progress) to compile minimum standards and criteria for certain vital aspects of the rail transportation environment, which could form the basis for affirmatively regulating a uniform level of safety even within the constraints of the status quo.

The CTC's ability to protect its research and development staff complement is being limited and because of constraints, subject to priority ranking by management.

There may be a conflict of interest confronting the regulatory body and its administrative staff, as they conduct accident investigations and may subsequently be required to act as a judiciary body.

Enforcement has been reviewed

- Problems have been identified

In context with the geographic distribution of the rail transportation system in Canada and reasonable expectations regarding the level of public safety, the number of enforcement officers today is not adequate for ensuring sufficient supervision of compliance with existing CTC regulations.

The CTC's obvious reliance on railway company management to police those aspects of rail transportation which have a direct bearing on the level of public safety has not resulted in substantial improvements in this area.

There are a number of sources of recognized stature and authority in railway matters, which have interpreted respective available data to indicate a deterioration in the level of public safety.

There is a documented lack of responsive attention and follow-up action by the regulatory body, to a large number of long standing enforcement related complaints from within the railway operations environment. These complaints are in relation to the railways' internal inspection and corresponding maintenance practices for system components, which directly contribute to operations safety and therefore bear on the level of public safety.

The CTC's obvious reluctance or lack of ability to pursue violations of its regulations through prosecution, is not likely to establish a climate of high-profile attention to public safety in railway management. (Selective enforcement and prosecution can be a useful tool to focus priority attention on system wide deficiencies in those areas which can be identified to have a significant detrimental impact on public safety.)

The CTC's ability to protect its enforcement staff complement has been limited due to constraints imposed by government.

The CTC's ability to attract suitable personnel to its enforcement staff positions is limited by conditions which seem to favour personnel from the railway management classes and by unattractive levels of compensation.

System safety has been reviewed.

- Problems have been identified:

The data show that the absolute hazard generated by the rail transportation system to the Canadian public:

(1) rose sharply in 1979 due to derailments
(2) rose sharply in 1979 due to collissions
(3) rose sharply in 1979 due to the presence of dangerous goods.
(4) declined slightly in 1979 relative to crossings.

The Railways' Safety Program has been reviewed

- Problems have been identified:

Railway management has not succeeded in balancing the economic performance objectives with public safety objectives, to satisfy reasonable public expectations; or has failed to correctly identify or appreciate these expectations.

Railway management has biased decisions relative to operations, with strong thrusts towards more payload per transportation unit (i.e. larger cars with

greater carrying capacity, longer trains, etc.), with considerable impact on the aging technology of the infrastructure, rolling stock and the traffic control and monitoring systems (i.e. greater wheel contact and impact loads,limitations on in-transit visual monitoring of running gear, etc.)

Upgrading and maintenance of the infrastructure, rolling stock, control and operating systems appear to be out of step with the demands of traffic to the extent, that resonable public safety expectations are not being met.

Railway management is at the same time transforming the operations, infrastructure, traffic control and rolling stock monitoring and maintenance systems away from traditional staff intensive procedures. Replacement systems have been integrated relatively successfully in some instances, in others, existing systems are being curtailed or eliminated. Management of this process is not maintaining safety levels in line with reasonable expectations.

Current initiatives at the federal Government level have been reviewed and their probable effect has been assessed

The outlined federal level initiatives will have a moderate impact on absolute rail safety, due to intermodal compatibility of specifications, standards, documentation and responsibilities.

The regulatory terminology, which is in line with the Canadian standard and judicial interpretation, should ensure uniformity in judgements. Precedents established in the Courts in context with Canadian social standards and levels of expectation should ensure high levels of compliance.

The specific mandate of the Transportation of Dangerous Goods Branch of Transport Canada should cause sufficient profile to ensure resource allocations, and responsiveness to changing public expectations.

In turn this should cause upgrading of the mechanisms that ensure public safety in the transportation of dangerous goods, reasonably in step with expectations.

Opportunities for Ontario action are identified

- A policy to ensure rerouting of dangerous goods rail traffic around Ontario population centres and restrictions on land use within a wide corridor about the rail line.

- A policy to cause dangerous goods cargoes to be consolidated in special trains (where practicable) and imposition of constraints on train operations, in terms of any one or all of route, time and speed; optionally combined with publication of traffic time tables.

- A policy to cause segregation of dangerous goods cargoes according to potential hazards due to the properties of the dangerous goods and imposition of contraints on operations which specifically address the dangerous properties of the cargo; optionally combined with publication of traffic time tables.

- A policy to ensure limitations on quantities of dangerous goods cargoes, depending on the potential hazards due to the properties of the dangerous goods, combined with measures outlined in the other options.

- Moral suasion of the Ontario Government through the federal Minister of Transport to cause a change in CTC's regulatory and enforcement philosophy and moderation of constraints on the agency.

- In negotiating the implementation of the Transportation of Dangerous Goods Act in Ontario;the adoption of a negotiating stance which would cause the transfer of accident investigation responsibility from CTC to the Ministry of Transport.

- A negotiating stance which would provide the Ontario Government with qualified resources to ensure compliance with regulations in railway transportation, combined with a thrust to include minimum standards and performance criteria for rail cars transporting dangerous goods in regulations under the Transportation of Dangerous Goods Act.

- Investigation of the possibility of enforcement of appropriate existing Ontario legislation and regulations protecting the environment, labour, agricultural land, etc., on grounds, that conditions or actions within the railway right-of-way, on land of the Crown in Right Of Ontario, violates such legislation and regulations; or the development of respective specific legislation.

- Moral suasion of the Ontario Government directed at railway management to increase the bias towards public safety objectives (as identified by the Ontario Government from time to time).

- Moral suasion of the Ontario Government to slow or reverse the trend of system changes from traditional staff intensive monitoring, maintenance and operations procedures for train consists carrying dangerous goods, until replacement systems are designed and proven to significantly reduce the level of absolute hazard to the Ontario public.

- Moral suasion of the Ontario Government and/or publication of criteria, to cause priority upgrading of infrastructure, rolling stock, control and operating systems in corridors where dangerous goods are transported, to such standards and performance criteria as required to ensure public safety objectives (as identified by the Ontario Government from time to time).

  The development and publishing of Ontario Government safety improvement criteria for rail transportation directed at reducing the absolute hazard within a defined time frame and modified from time to time, to reflect reasonable public safety expectations as identified by the Ontario Government; and publication of information on compliance.

BACKGROUND

Railway accidents involving the release of substantial quantities of dangerous goods cargo have recently received widespread official and public attention.

Specifically the CP Rail freight train, derailed in the City of Mississauga on November 10, 1979 with its great impact on the citizens of that community, has created a renewed and deep concern with the operational safety of the rail transportation mode.

The Mississauga accident was by no means an isolated incident in the history of dangerous goods transportation by rail. In fact, an earlier series of serious rail accidents between 1967 and 1970 caused an investigation into railway safety by the Railway Transport Committee of the Canadian Transport Commission.

The Railway Safety Inquiry started its sittings on January 18, 1971 in Ottawa, Ontario. The inquiry developed from a series of hearings on three specific accidents (at Cobourg, Port Hope and Brockville, Ontario, all in the summer of 1970), into hearings on railway safety generally.

The inquiry encompassed 46 sitting days, hearing evidence from 75 witnesses and reviewing all aspects of the railways' policies, practices and rules on the carriage of dangerous goods.

Between the specific accident related hearings and the wider inquiry, and during and following the latter, other major derailments involving dangerous goods occurred, increasing the already high concern.

The results of the Railway Transport Committee Inquiry into the safety of railway operations were published in 1973.

The Canadian Transport Commission reported the Rail Transport Committees' conclusion that "train wrecks had reached such proportions as to require action more drastic than its prevailing safety programme entailed" and that "...there is still a long way to go before acceptable standards of operation and maintenance of railway trains are reached in Canada".

The Inquiries' conclusions included references to and recommendations on some sixteen topics, which covered signal systems and traffic control, tracks and roadbed, rolling stock, accident investigation, etc.

The Rail Transport Committee at that time believed "...that it has been able to obtain, through the mechanisms of the Railway Safety Inquiry, all of the information it needs to do its part toward achieving ...higher standards of operation and maintenance of railway trains in Canada"

Today in July 1980, some seven years after the conclusion of the RTC Inquiry, the Canadian Railway Labour Association*, in its submission to the Mississauga Rail Accident Inquiry contends that

> "In our opinion, the Railway Transport Committee have in many areas of safety, simply declined to affirmatively regulate on matters that called for such regulation, to ensure an optimum level of safe operation." (CRLA, February, 1980, Page 39-40)

The CRLA concludes that "the various committees of the Canadian Transport Commission, including the Railway Transport Committee, appear to have wide powers under the legislation, but fall short of intermediate enforcement procedures..." and, "the problem is...in the philosophy of the Railway Transport Committee in their approach to the regulation of the railways."

From this and other submissions to the Standing Committee on Transport and Communications of Parliament of Canada, as well as submissions to the Mississauga Inquiry from the labour unions, other parties outside of the rail transportation industry and from generally available statistics it appears, that progress in the area of safety has been slow and that circumstances have not changed substantially in the area of improved rail safety since the early 1970's.

* Canadian Railway Labour Association (CRLA) is comprised of 15 railway unions who collectively represent over 90,000 workers employed on Canada's railway systems.

SYSTEMS SAFETY REVIEWS ELSEWHERE

The issue of the transportation of dangerous goods by rail has received considerable attention and concentrated research in the United States.

As late as December 1978, a Systems Safety Analysis Subcommittee of the Interindustry Task Force, Rail Transportation of Hazardous Materials, submitted a Phase I final report.

This report presents analyses of accident and incident data designed to develop preliminary statistics that place the overall issue of hazardous material rail transportation more clearly into perspective by comparing hazardous material shipments with other rail shipments. The report identifies areas that require closer attention. It also discusses risk analysis and other techniques for application to the problem of hazardous material releases from tank cars. Counter measures are suggested by various U.S. sources. The report provides an initial screening of these countermeasures and a preliminary analysis of the influence of train length on accidents.

In the absence of similar specific research covering Canadian railways, it may be useful to extrapolate the U.S. data to establish a basic perspective on the same topic in Canada. Although the regulatory system is quite different, the basic rail system infrastructure and components, technical standards, operating rules and general freight consists may be sufficiently similar to allow such extrapolation.

For this purpose, the executive summary of the reseach report has been included in Appendix "A".

JURISDICTION IN CANADA

The Law Reform Commission of Canada has reviewed the history, structure, judicial and legislative powers of the Canadian Transport Commission. In the Administrative Law Series Publication, entitled "The Regulatory Process of the Canadian Transport Commission", these powers were identified:

> "The National Transportation Act divides authority into what may be characterized generally as judicial and legislative powers."

In the application of these powers to the rail mode the Railway Transport Committee may exercise its judicial functions:

First, the (Committee) has full jurisdiction to inquire into, hear and determine any application by or on behalf of any party interested:

(a) Complaining that any company or person has failed to do any act, matter or thing required to be done by the Railway Act or by any Regulation, Order or Direction made thereunder...or is doing any act, matter or thing contrary to or in violation of The Railway Act...

(b) Requesting the (Committee) to make any order, or give any direction, leave, sanction or approval that by law it is authorized to make or give.

Second, the (Committee) may order and require any company or person to do...any act, matter or thing that such company or person is or may be required to do under The Railway Act, and may forbid the doing or continuing of any Act, matter or thing that is contrary to the Railway Act...

In exercising its legislative powers:

The (Committee) may make Orders or Regulations

(a) with respect to any matter, act or thing that by the Railway Act is sanctioned, required to be done or prohibited,

(b) generally for carrying the Railway Act into effect.

To expand on the above:

The National Transportation Act provides the basis in Law for the Canadian Transport Commission and the respective mode specific Transportation Committees. For example, it conveys duties and powers respecting...

- sittings and business;
- the formulation of transport policy and development;
- the establishment and powers of Committees for the Commission;
- the making of rules and regulations.

Mode specific Acts extend the definition of duties and powers of the Canadian Transport Commission and the respective Transport Committee.

The Railway Transport Committee of the Commission has jurisdiction over all that rail transport environment to which the Railway Act applies. Its scope includes railway construction, location, abandonment, tariffs and safety.

The Railway Act applies to all persons, railway companies and railways, within the legislative authority of the Parliament of Canada, except government railways, to which it applies to such extent as is specified in respective Acts.

The extent of application is further defined to cover:

(a) Every railway company incorporated elsewhere than in Canada and owning, operating or running trains or rolling stock on any lines of railway in Canada, either owned, controlled, leased or operated by such a company;

(b) Every railway company operating or running trains from any point in the United States to any point in Canada;

(c) Every railway operated by a company wholly or partly within the legislative authority of the Parliament of Canada regardless of the method of control exercised by the company and regardless whether such control is acquired or exercised under authority of the Parliament of Canada or the legislature of any province or other jurisdiction. It also specifically includes any railway or portion thereof, regardless of how it is controlled, which is declared to be a work for the general advantage of Canada.

Furthermore it specifically includes every railway, the construction or operation of which is authorized by special Act of the legislature of any Province and which connects or crosses any railway within the legislative authority of Parliament of Canada. Such railways are subject to provisions of the Act relating to:

(a) The connection or crossing;
(b) criminal matters, including offences and penalties;
(c) navigable waters.

Specifically excluded are any street railway, electric suburban railway or trainway that has been constructed under the authority of a provincial legislature and that has not been declared to be a work for the general advantage of Canada.

THE CANADIAN TRANSPORT COMMISSION

An extract from the Commissions 13th Annual Report, 1979 will serve to outline the structure and organization of the Commission and the Rail Transport Committee.

Appendix "B" provides a concise overview of statutory duties and powers of the CTC.

Appendix "C" provides an overview of the function and administrative structure of the Rail Transport Committee, outlining the scope of the four administrative branches of the RTC and their activities during 1979, including some overview statistics.

Staffing levels of the administrative branches and their regional offices (effective June 1980) are identified in the chart: "R.T.C. Distribution of person-years" attached as Appendix "D".

LEGISLATION, REGULATIONS AND OTHER INSTRUMENTS OF CONTROL

In addition to the already identified legislation which essentially establishes the jurisdiction, duties and powers of the CTC and RTC, as well as regulating the corporate and business environment of the railway companies, the CTC has promulgated general rules, general orders, regulations, orders and guidelines.

General Rules primarily define CTC/RTC administrative methodology.

There are three broad categories of General Orders (identified today):

(a) Operating;relating to railway operations
(b) Engineering;relating to infrastructure standards
(c) Traffic;relating to terms and conditions of rail traffic.

Essentially the function of "General Orders" is synomymous with the function of "Regulations" in terms of authority and impact on the rail transportation environment. However, General Orders are also used to prescribe extensive sets of rules referred to as "Regulations".

Typical examples for these functions would be:

- General Order	001	Regulation for reporting of accidents
	010	Safety appliances
	031	Bulk storage facilities for Liquid Petroleum Gas
	035	Chlorine tanks
- General Order	1974-1-Rail	Prescribes Regulations for the transportation of dangerous commodities by Rail.
	873	Prescribes the Uniform Code of Operating Rules

The CTC identifies two categories of Orders:

(a) permissive
(b) mandatory

In general terms, Orders are directed at individual parties or members of the rail transport environment, such as a railway company.

Permissive orders generally provide authority to do things following an application.

Mandatory orders generally are aimed at correction or improvement of unsatisfactory conditions.

The CTC also issues procedures or guidelines which generally define actions where the level of administrative control desired by the commission is such that the more formal instruments are not warranted.

Depending on the level of severity, frequency of occurrence or isolated nature of a situation, simple letters of instruction may be issued from within the administation of the R.T.C.

From the above it seems that the Canadian Transport Commission and the Railway Transport Committee has regulatory and judicial powers which are adequate for the administration of the railway transportation mode in Canada.

The CTC philosophy in employing these powers is reflected typically in the following excerpt from the submission of the Canadian Railway Labour Association to the Mississauga Inquiry:

> "The Railway Transport Committee policy, historically has been to generally allow the railway companies to agree on minimum standards through an association of Canadian railway companies called the Railway Association of Canada. There are few exceptions to this procedure, the major one being...general order no. 873, dated the 15th day of November 1961 entitled "Uniform Code of Operating Rules (U.C.O.R.)". The U.C.O.R. was last updated in the year 1962. However, the railway companies are permitted to issue instructions to employees, interpreting or expanding these rules, without first obtaining approval from the Railway Transport Committee, the rule being, that as long as the railway companies' instructions do not modify the intent of the particular rule, then this procedure is acceptable."

The Labour Association goes on quoting U.C.O.R. modifications taken from current CN rail general operating instructions to demonstrate the generally permissive attitude of the C.T.C.

"Rules F, G, H, M. Rules 3, 16, 20, 21, 26, 27, 93, 103, 104-104E, 104C, 107, 111, 206, have been modified without the approval of the Railway Transport Committee."

The Labour Association makes no comment on the individual modifications, but is deeply concerned with the lack of supervision by the Rail Transport Committee.

The Associations brief continues: A completely new method of dispatching and controlling the movement of trains across Canada by means of radio communications has been introduced by the railways and is operating under instructions written by the railways through the Railway Association of Canada.

There is (sic) no minimum standards regarding radio-operations enforceable by the regulatory body, the Railway Transport Committee.

CP-Rail reports on the introduction of radio into the train control system:

> 3970 Radio units in 1974
> 4630 Radio units in 1975
> 5298 Radio units in 1976
> 6248 Radio units in 1977
> 6840 Radio units in 1978
> 8830 Radio units in 1979
>
> "By the end of 1979 there were 9 train dispatching offices equipped with point-to-train two-way radio communications covering some 29 subdivisions of the system."

In their presentation "Review of Railway Safety" to the Railway Transport Committee, July 31, 1979, CP Rail comments:

> "The whole structure of the present Uniform Code of Operating Rules is based on the handling of train orders over telegraph or telephone...
> ...In the next revision to the Uniform Code of Operating Rules a great deal of thought must go into the effect radio will have on the future operation of railways; both from the standpoint of safety and efficiency."

A substantial amount of evidence and opinions of a similar nature as the preceding samples have been presented to the Standing Committee on Transportation of the Parliament (of Canada) in its considerations of Bill C-18, an Act to Promote Public Safety in the Transportation of Dangerous Goods, and the Inquiry of the Mississauga derailment.

The essence of this information seems to be that:

(1) The Canadian Transport Commission and Railway Transport Committee have adequate regulatory and judicial powers to ensure acceptable levels of public safety (in context with the rail transportation mode).

(2) The measures undertaken by the regulatory body in response to the 1970 Inquiry into Rail Safety, have not been substantially effective in improving the level of public safety in line with reasonable expectations.

(3) The regulatory body's low-key profile in using its extensive powers affirmatively, seems to result in slow progress in improving the level of public safety.

(4) The regulatory body's extensive reliance on self-regulation by the railway companies does not seem to have produced substantial improvements in the level of public safety, in line with reasonable expectations.

(5) The regulatory body's response to the aging of the technology employed in the Canadian railway infrastructure and rolling stock, does not seem to provide adequate and timely compensating measures to maintain a level of public safety in line with reasonable expectations.

(6) The regulatory body seems to be slow in assessing opportunities for constructive changes to the rail transportation system which may result from technological innovations. Its level of response to such opportunities does not seem to actively encourage substantial and timely upgrading of the rail transportation environment, to achieve improved public safety.

(7) Substantial work seems still to be required (some of it in progress) to compile minimum standards and criteria for certain vital aspects of the rail transportation environment, which could form the basis for affirmatively regulating a uniform level of safety even within the constraints of the status quo.

(8) The CTC's ability to protect its research and development staff complement is being limited and because of constraints, subject to priority ranking by management.

(9) There may be a conflict of interest confronting the regulatory body and its administrative staff, as they conduct accident investigations and may subsequently be required to act as a judiciary body.

Enforcement of CTC rail regulations:

A complement of 78 CTC rail system safety inspectors cover the rail infrastructure, rolling stock, equipment, personnel and services. The complement includes accident investigators.

CTC inspectors also conduct spot checks on piggy-back equipment and containers at the point of origin.

Minutes of proceedings of the Standing Committee on Transport respecting Bill C18 record that:

"Blue Book estimates for the fiscal year 1980-81 show a further reduction in the number of railway safety inspectors. In 1978-79 we had 107, in 1979-80 it was down to 105 and for 1980-81 it is down to 100. Of that 100, 25 are grade crossing administration so we really only have 75 (sic) ...rail safety inspectors. Surely this is totally inadequate with around tens of thousands of miles of railway lines alone in this country..." (CN approx. 24000 miles, CP approx. 17000 miles).

Appendix "C" page C2, "Equipment Quality Control" and "Railway Infrastructure Quality Control" will convey an appreciation of the inspection workload during 1979.

The Commission also approves Independent Inspection Agencies to verify compliance with CTC regulations on the packaging of dangerous goods.

The scope of these agencies extends to verification of materials used in and construction of certain containers for these goods, such as portable tanks, steel cylinders, fibre board containers, etc.

Packaging standards essentially are equivalent to the U.S. Code of Federal Regulations, Title 49 except that package marking must carry "CTC" instead of "DOT" lettering.

Container standards are identical to U.S. CFR 49 except for the distribution of the respective detailed data report.

In general terms it can be stated that the attainable level of safety afforded by CTC dangerous goods regulations is essentially equivalent to that afforded by U.S. CFR 49, depending on compliance and respective enforcement efforts.

In conclusion it is fair to say that:

(1) In context with the geographic distribution of the rail transportation system in Canada and reasonable expectations regarding the level of public safety, the number of enforcement officers today is not adequate for ensuring sufficient supervision of compliance with existing CTC regulations.

(2) The CTC's obvious reliance on railway company management to police those aspects of rail transportation which have a direct bearing on the level of public safety has not resulted in substantial improvements in this area.

There are a number of sources of recognized stature and authority in railway matters, which have interpreted respective available data to indicate a deterioration in the level of public safety.

(3) There is a documented lack of responsive attention and follow-up action by the regulatory body, to a large number of long standing enforcement related complaints from within the railway operations environment. These complaints are in relation to the railways' internal inspection and corresponding maintenance practices for system components, which directly contribute to operations safety and therefore bear on the level of public safety.

(4) The CTC's obvious reluctance or lack of ability to pursue violations of its regulations through prosecution, is not likely to establish a climate of high-profile attention to public safety in railway management. (Selective enforcement and prosecution can be a useful tool to focus priority attention on system wide deficiencies in those areas which can be identified to have a significant detrimental impact on public safety.)

(5) The CTC's ability to protect its enforcement staff complement has been limited due to constraints imposed by government.

(6) The CTC's ability to attract suitable personnel to its enforcement staff positions is limited by conditions which seem to favour personnel from the railway management classes and by unattractive levels of compensation.

Rail transportation system safety

To arrive at an appreciation of rail system safety an appropriate perspective must be established first.

It is useful to identify the hazard to the Canadian public generated by the system. For example, to identify the relative hazard within or between transportation modes, one would measure in terms of accidents or incidents per unit transportation output (i.e. accident costs, number of casualties, number of people affected, etc. per ton-mile for freight, or specifically for dangerous goods freight transported; or per passenger-mile).

To identify the absolute hazard generated by a transportation mode, one would measure the numbers of accidents or incidents (casualities, collisions, derailments, spills of dangerous goods, etc.) per fixed time reference (i.e. month, year), independent of traffic volume.

The absolute hazard is a measure of indirect impact of accidents on the general public or the environment and should be used for determining the acceptable level of relative hazard (J. Lukasiewicz, An Assessment of Canadian Railways' Safety, 1980).

The Railway Transport Committee has provided reasonably up-to-date data on the rail transportation system and CP rail contributed data relative to its performance for evaluation from both perspectives (Appendix "E").

The data show that the absolute hazard generated by the rail transportation system to the Canadian public:

(1) rose sharply in 1979 due to derailments
(2) rose sharply in 1979 due to collissions
(3) rose sharply in 1979 due to the presence of dangerous goods.
(4) declined slightly in 1979 relative to crossings.

Detailed data identify the causes for derailments in four categories:

- track conditions;
- rolling stock;
- track cars (maintenance vehicle);
- miscellaneous;

there is a sharp rise across-the-board in all categories in 1979.

Further detail identifies the equipment (on the rolling stock) which failed, causing derailment, in two categories:

- journal failures;
- other component failures;

there is a sharp rise in journal failures regardless of type in 1979.

Specific performance of the friction type bearing (early technology) is identified in a separate table. The leading defects are:

- Undertermined (not identified)
- Journal box dry (no lubricating medium)
- Journal pitted or rough
- Journal cut or seamed
- Lubricator pad glazed
- Other

In overview these conditions involve the railway infrastructure, control systems, rolling stock and the specific system for handling dangerous goods. All the identified factors which contribute to the absolute hazard generated by the system, except for crossing accidents which may reflect on the management of the other transportation mode, are under direct control of railway corporate management and reflect the effectiveness of supervisory measures superimposed by the regulatory body. They are also a measure of the short term effectiveness of management and regulatory action and in the long term of management and regulatory philosophy.

The information supplied by CP Rail includes a comparison with other national or state railways on the international scene. The data are up to 1977. Their relevance and meaning in the Canadian context is difficult to assess as the reporting basis may differ significantly between jurisdictions and is not known to the writer. The information is included as it is "interesting".

The Railways' Safety Program and its implementation

To provide an overview of the safety program an exhaustive CP rail presentation to the RTC Review of Rail Safety (July 31, 1979) has been selected and is attached in Appendix "F".

CN's program would be similar but may be different in detail.

For example, both CN and CP have a Safety Section at their respective headquarters, the primary responsibility of which, to quote CP is to "... coordinate personal injury accident prevention programs throughout the (CP) railway system."

Both, operational system safety and to a lesser extent employee safety are of concern, as both affect the absolute and relative hazard generated by the rail transportation environment.

The safety programs outlined in CP's submission include:

- Training in personal safety;
- Training of apprentices and trades in their crafts;
- Training in traffic operations, rules and procedures;
- Training in operations emergency response;
- Training in dangerous goods handling and emergency response; etc.

- Information programs directed at the public

- Systems inspection and maintenance
  - of infrastructure and control systems;
  - of rolling stock and equipment;
  - of shop plant and equipment;

- Systems development i.e. procedures, operations rules, job performance rules, forms, manuals, etc.

- Research and development i.e. accident investigation

  automated operations monitoring and control facilities;

  automated inspection and maintenance of way facilities;

  innovations in rolling stock and equipment; etc.

The greatest short term impact on the level of public safety (reduction in absolute hazard) should result from system inspection and maintenance.

There are strong opinions on and assessments of the inspection and maintenance environment which indicate that these operations are not performed as they should be.

From the perspective of the labour trades that perform these functions railway management have biased the systems that traditionally ensured operations safety away from human oriented, labour intensive inspection and maintenance. This bias affects monitoring and maintenance of infrastructure, control systems, rolling stock and in-transit train support, operations and performance monitoring functions. The labour trades assert that in some cases drastic staff reductions and modifications of work performance standards, over time, have seriously impacted the level of public safety. The trades have also analysed the impact of the regulatory body's philosophy and performance in this context. Numerous dramatic examples are provided in documentation (attached as Appendix "G") by the individual labour trade Unions and the Canadian Railway Labour Association.

An independent source (outside of the railway environment) has supported some of the above with statistical analysis (Lukasiewicz, An Assessment of Canadian Railways Safety), Attached as Appendix "H".

It would be fair to say that:

(1) Railway management is operating under constraints which affect economic performance substantially and are in part imposed by the regulatory body. Railway management also has full responsibility for the railway infrastructure. All related work is very expensive. Relief in terms of subsidies is provided where operations are not viable but desirable for the general advantage of Canada.

(2) Railway management has not succeeded in balancing the economic performance objectives (within the above constraints) with public safety objectives, to satisfy reasonable public expectations; or has failed to correctly identify or appreciate these expectations.

(3) Railway management has biased decisions relative to operations, with strong thrusts towards more payload per transportation unit (i.e. larger cars with greater carrying capacity, longer trains, etc.), with considerable impact on the aging technology of the infrastructure, rolling stock and the traffic control and monitoring systems (i.e. greater wheel contact and impact loads, limitations on in-transit visual monitoring of running gear, etc.)

(4) Upgrading and maintenance of the infrastructure, rolling stock, control and operating systems appear to be out of step with the demands of traffic to the extent, that resonable public safety expectations are not being met.

(5) Railway management is at the same time transforming the operations, infrastructure, traffic control and rolling stock monitoring and maintenance systems away from traditional staff intensive procedures. Replacement systems have been integrated relatively successfully in some instances, in others, existing systems are being curtailed or eliminated. Management of this process is not maintaining safety levels in line with reasonable expectations.

Current initiatives impacting on rail transportation systems safety

At the federal level, Bill C-18, an Act to promote public safety in the transportation of dangerous goods, has been passed by the House of Commons, July 16, 1980 and received Royal Assent on July 17. It is now awaiting proclamation. The Act is included as Appendix "I".

Responsibility for the Act resides with Transport Canada, Transportation of Dangerous Goods Branch. Transport Canada will negotiate and enter into agreements, or by other mechanisms delegate certain duties and powers under the Act and regulations to other jurisdictions at federal, provincial and municipal levels.

The Act and regulations will apply to all modes of transportation, including rail, for the transport of substances identified as dangerous goods. The Act will prevail over any existing legislation in the event of a conflict. The regulations, known as the Dangerous Goods Code, define the application, interpretation, classification (of dangerous goods), communications (of related information) and responsibilities in Volume I. Volume I, Lists set out details of packaging options, quantity limits by mode etc. Volume II sets out the details of standard specifications for the testing and construction of packages, tank containers and tank vehicles. The code is basically a refinement of United States Code of Federal Regulations Title 49 specifications.

The Act conveys extraordinarily broad inspection powers and has significant fines for violations. It also establishes compatibility of regulations between modes, thus streamlining transfer of cargo. It includes comprehensive documentation requirements which are intended to ensure availability of information on dangerous goods in case of accidents, etc. In the case of rail transport, the regulations will include rules for positioning dangerous goods carrying cars in the train. In addition the Transportation of Dangerous Goods Branch proposes to examine existing specifications for railway tanks with the view of improving the Dangerous Goods Code.

The Branch has already performed limited scale model testing of a promising new insulating material for pressurized tank cars.

It is now looking for sponsors of full scale tests.

Bill C-21, an Act to implement the international convention for safe Containers (transport equipment to facilitate transport of goods by one or more modes of transport, without reloading), is awaiting proclamation.

This Act sets out criteria for safety approval evidenced by attaching a safety approval plate.

Container owners, in addition to initial safety approval, are required to carry out and certify periodic inspections according to defined procedures.

Additional structural safety requirements and tests can be imposed for air transport and for specially designed containers of dangerous goods or bulk liquids.

There are provisions for accident inquiries in accidents involving a Container where personal safety, property or environmental damage is a factor.

The Act aligns Canadian container standards with those of contracting parties to the International Convention for Safe Containers.

The Transportation of Dangerous Goods Branch has implemented an Emergency Response and Information system as a focal point for collecting and disseminating up-to-date technical information on thousands of dangerous substances known to be in use in Canada.

The Inquiry into the Mississauga derailment commissioned by an Act of Parliament will develop an understanding of the factors which caused the accident and an appreciation of rail safety in general. The specific recommendations of the commissioner, Mr. Samuel G.M. Grange, should generate priority attention to identified deficiencies.

It is fair to say that:

(1) The outlined federal level initiatives will have a moderate impact on absolute rail safety, due to intermodal compatibility of specifications, standards, documentation and responsibilities.

(2) The regulatory terminology, which is in line with the Canadian standard and judicial interpretation, should ensure uniformity in judgements. Precedents established in the Courts in context with Canadian social standards and levels of expectation should ensure high levels of compliance.

(3) The specific mandate of the Transportation of Dangerous Goods Branch of Transport Canada should cause sufficient profile to ensure resource allocations, and responsiveness to changing public expectations.

In turn this should cause upgrading of the mechanisms that ensure public safety in the transportation of dangerous goods, reasonably in step with expectations.

(4) The central emergency response and information systems, implemented by the Transportation of Dangerous Goods Branch should, with increasing experience and upon upgrading of respective communications systems, become an effective tool in dealing with transportation emergencies.

At the provincial level, in terms of current initiatives, this paper provides information specifically requested by the Ontario Task Force on Provincial Rail Policy.

The Ministry of Transportation and Communications, Dangerous Goods Transportation Office has been implemented in response to Ontario Cabinet Minute 6-49/79.

The Cabinet Minute requested M.T.C. to assume the lead role in developing a strategy in the transportation of dangerous goods. In response, M.T.C. has created a Dangerous Goods Transportation Office. The new office is presently discussing adoption of the National Code with other Ministries; has identified areas of conflict evident in existing Ontario legislation and regulations; developing regulation making it mandatory for vehicles carrying dangerous goods to undertake a mandatory safety inspection and providing the public with advice as required on the status of existing and proposed regulation.

Responsibility

Recommend appropriate method(s) of adopting and implementing the uniform National Code of Regulation for the transportation of dangerous goods.

Recommend, and implement other measures to ensure the safe transportation of dangerous goods.

Activities

(a) Consult with the Federal government, both directly, and through CCMTA Working Group #5 in the development of the National Code of Regulation.

(b) Identify, through consultation with other Ministries, areas of conflict with existing Ontario legislation/regulation and recommend ways of resolving the conflicts.

(c) Liaise with private industry and the for-hire trucking industry to maintain an awareness of their reactions to development of the National Code.

(d) Monitor developments in other Canadian jurisdictions and the U.S.A.

(e) Provide advice to the public on the status of present and proposed regulation.

M.T.C. has increased safety related spot checks at vehicle inspection stations on the highways and at private industry truck depots, of all vehicles transporting dangerous goods.

M.T.C. is drafting a regulation which will make it mandatory for all vehicles transporting dangerous goods to undergo periodic safety related mechanical inspections in a programme similar to the programme presently in existence for dump trucks and buses.

Opportunities for Ontario action

There are two main avenues for responding to the present level of hazard to the Ontario public caused by the rail transportation environment.

(1) Symptomatic responses; these initiatives address the level of relative hazard by constraining the impact of the rail transportation system deficiencies on the public.

Such measures would essentially be directed at increasing the "buffer zone" between the hazard and the Ontario public. Respective policy and actions would have a high visibility, but are relatively short-lived in terms of effectiveness, as they will be based on either geographic isolation, subject to pressures for land use, or constraints on railway operations, subject to pressures for efficiency.

The following are identified but have not been evaluated to determine their efficiency due to time constraints.

- A policy to ensure rerouting of dangerous goods rail traffic around Ontario population centres and restrictions on land use within a wide corridor about the rail line.

- A policy to cause dangerous goods cargoes to be consolidated in special trains (where practicable) and imposition of constraints on train operations, in terms of any one or all of route, time and speed; optionally combined with publication of traffic time tables.

- A policy to cause segregation of dangerous goods cargoes according to potential hazards due to the properties of the dangerous goods and imposition of contraints on operations which specifically address

the dangerous properties of the cargo; optionally combined with publication of traffic time tables.

- A policy to ensure limitations on quantities of dangerous goods cargoes, depending on the potential hazards due to the properties of the dangerous goods, combined with measures outlined in the other options.

(2) Responses addressing the root cause of deficiencies. These initiatives impact on the level of absolute hazard.

The strategies are again identified, but have not been evaluated to determine their efficiency.

(a) A strategy aimed at persuading the Canadian Transport Commission or Rail Transport Committee to regulate and enforce regulations more affirmatively.

Some tactical alternatives are:

- Moral suasion of the Ontario Government through the federal Minister of Transport to cause the change in CTC philosophy and moderation of constraints on the agency.

- In the implementation of Bill C18; the adoption of a negotiating stance which would cause the transfer of accident investigation responsibility from CTC to the Ministry of Transport.

- A negotiating stance which would provide the Ontario Government with qualified resources to ensure compliance with regulations in railway transportation, combined with a thrust to include minimum standards and performance criteria for rail cars transporting dangerous goods in C-18 regulations.

(b) A strategy aimed at persuading railway management to improve the safety of the railway transportation system.

Some tactical alternatives are:

- Investigation of the possibility of enforcement of appropriate existing Ontario legislation and regulations protecting the environment, labour, agricultural land, etc., on grounds, that conditions or actions within the railway right-of-way, on land of the Crown in Right Of Ontario, violates such legislation and regulations; or the development of respective specific legislation.

- Moral suasion of the Ontario Government directed at railway management to increase the bias towards public safety objectives (as identified by the Ontario Government from time to time).

- Moral suasion of the Ontario Government to slow or reverse the trend of system changes from traditional staff intensive monitoring, maintenance and operations procedures for train consists carrying dangerous goods, until replacement systems are designed and proven to significantly reduce the level of absolute hazard to the Ontario public.

- Moral suasion of the Ontario Government and/or publication of criteria, to cause priority upgrading of infrastructure, rolling stock, control and operating systems in corridors where dangerous goods are transported, to such standards and performance criteria as required to ensure public safety objectives (as identified by the Ontario Government from time to time).

  The development and publishing of Ontario Government safety improvement criteria for rail transportation directed at reducing the absolute hazard within a defined time frame and modified from time to time, to reflect reasonable public safety expectations as identified by the Ontario Government; and publication of information on compliance.

THE "W.I." SCENARIO

A REPORT PREPARED FOR THE ONTARIO TASK FORCE

ON

PROVINCIAL RAIL POLICY

BY

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VANCOUVER

23 July 1980

TABLE OF CONTENTS

PREFACE

"What if" is a question asked by many when planning for the future. In this paper, we look at seven man-made possible dangers and three natural disaster situations which have the potential of disrupting the normal flow of people and goods within Ontario.

Each scenario would require intermodal cooperation and some pre-planning to effect as short a disruption in the normal flow of traffic as possible.

The purpose of the paper is to indicate the type of action required in the event of a disaster, and to demonstrate the role rail transportation could play in each circumstance.

INTRODUCTION

Annex "A" contains the Task Description assigned by the Ontario Task Force on Provincial Rail Policy for the "W.I." Scenario Study.

In undertaking the study, it was agreed that the following assumptions were applicable:

1. Cargo tonnage growth would occur along historical trend lines.

2. The cost of fuel would move to world price on a blended basis.

3. The energy self-sufficiency goal set by the Federal Government is achievable by the Year 2000.

4. The 35% energy self-sufficiency goal set by the Province of Ontario is achievable by the Year 1995.

5. The population will increase at a slower rate than experienced in the past 25 years, and aging trends will increase.

6. Over time, substitution of transportation mode utilization will occur as fuel prices increase or supply weakens.

The time frames used in the study are:

Short Run - up to 2 years
Long Run - beyond 2 years

3.

This study is an attempt to identify as many as possible of the potential man-made or natural events which could cause either total or partial interruption of the transportation system in Ontario.

Examples of potential events are used to demonstrate the need to develop contingency strategies. Various ways in which rail transportation might be impacted or play a role in these emergency situations are described.

Within the time constraint permitted for this project, it has been possible to take only a cursory glance at the vast problems involved. The study indicates that it will be necessary for a much wider and deeper investigation to be undertaken, in order to cover all the implications contained herein and to develop effective contingency plans.

MAN-MADE EVENTS

Inordinate Fuel Cost Increase

In the short run -- passenger traffic which is auto dependent would probably cause little change in current utilization levels, as it appears the public is ready to absorb increased costs at the expense of other commitments.

Road and rail freight traffic would also probably demonstrate little change in current utilization levels. Added costs would be passed on to the users of the system and ultimately spread through the economy. With fixed industry capital designed for specific inventory levels and transport links, the cost of adjusting the logistics of users and providers of the service would preclude major changes in transport patterns.

The tonnage distribution of freight movement by rail and road modes in Canada is approximately 57% and 43% respectively.

In the long run -- research has indicated the following changes in transport patterns are likely to occur:

a) Urban passenger traffic which is auto dependent would be forced through economic necessity to make greater use of more efficient services (i.e. car pools, municipal transit and commuter links).

b) Rural passenger traffic which is auto dependent and without adequately serviced existing alternatives would apply political pressure for increases to present service or for the institution of new or increased services (bus and dayliner) to major urban centres or other inter-city connectors.

c) Inter-city passenger traffic which is auto dependent would reduce trip frequencies or switch to more efficient modes (bus and/or rail).

d) Inter-city passenger traffic which is air dependent may switch to rail or bus service for short haul journeys (up to 300 miles) if air service is curtailed through economic necessity.

e) Freight traffic which is truck dependent would continue to use current methods for pick-up, delivery and short haul services (up to 300 miles). For the long haul, a rail or marine substitution could occur, depending upon the nature of the traffic and where the total cost of the service, including double handling, would be relatively less than fuel cost increases.

f) Freight traffic which is rail dependent would continue, except where marine substitution exists, the nature of the traffic permits such a mode change, or the total cost of the service, including double handling, is relatively less than fuel cost increases.

The impact of the foregoing on rail services in the Province is likely to be:

a) Short Run

Passenger traffic will increase on existing routes, including commuter services, while freight traffic will experience little or no change to existing demand.

b) Long Run

Urban passenger traffic on existing routes will increase, resulting in the need for the institution of new rail/bus/metro links and related infrastructure (i.e. park and ride) and the improvement of existing services or the institution of new services for rural areas, along with the up-grading and increasing of the frequency of inter-city passenger services.

Freight traffic will require the up-grading of intermodal link facilities, (containers, trailers, roll-on roll-off, etc.) to encourage rail or marine substitution for long haul road freight and the up-grading of intermodal link facilities (container and bulk handling services, yards, etc.) where substitution to marine from rail mode is possible.

Fuel Supply Stoppage

At present, Canada imports approximately a net 20% of oil requirements and, historically, refinery stock levels range from 60 to 90 days' supply. Transportation consumes

about 25% of the total supply, with less than 6% of this required for rail services.

An oil fuel supply stoppage may occur through an interruption to domestic and/or international supply. The scenarios for such an event could range from a pipeline outage to an international embargo on oil coming into Canada.

In the short run -- should supply curtailment occur, the response by consumers of oil would be little different than in the event of fuel cost increases, unless some form of priority allocation of product was introduced.

A stoppage of domestic supply would impose a serious threat to the interests of Ontario because of national dependency on domestic supply.

It is possible that world events could cause a continued long run stoppage to international supply. It is unlikely, either through the political process or the construction of new pipelines to the interrupted domestic sources, and/or the development of new domestic sources, that a long run stoppage of domestic supply would be allowed to continue.

The short run contingency could be met by the establishment of a supply allocation system, with priority being given to the most fuel efficient modes consistent with the maintenance of maximum economic activity within the Province. In addition, economy measures could be imposed through road vehicle speed restrictions and licencing mechanisms.

For the long run -- the contingency could be met through the continuance and expansion of the short run techniques until demand/supply were more in balance.

The impact of this type of event on the rail system in Ontario would be similar to that described under Fuel Cost Increases, since it is anticipated that the long run changes in transport demand would be about the same.

Rail System Outage Due To Dangerous/Hazardous Cargo

An incident similar to Mississauga is probable, because of the volume of dangerous/hazardous traffic which moves by all modes within and through the Province. The severity of the incident on the public and property would depend upon the location and transportation artery used. Temporary alternatives to the potential network impasse exist or could be constructed, so that the impact on transportation and logistic services could cause minimum inconvenience to users in the short run. There are unlikely to be any long run effects.

The evacuation of the public from a disaster scene, the maintenance of security and public safety within the damaged area, pose more complications. The experience of Mississauga will prove to be a useful model. However, the evacuation of the public from a densely populated inner-city area presents special problems for which municipal planners must be prepared.

Federal action to limit the possibility of an incident involving dangerous/hazardous cargo has been taken through the introduction of Bill C-18:

> "An Act to promote public safety in the transportation of dangerous goods."

Bill C-18 is to be applicable to all modes of transport, whether the dangerous goods originate from or are destined for Canada. Further, it would appear that the Act will:

a) respect provincial constitutional prerogatives,

b) anticipate provincial and perhaps municipal assistance in the inspection and enforcement of the policy and regulations.

If an incident occurs on a rail line on which no commuter service operates, the re-routing of traffic can be accomplished by the railways with limited impact on the system users. If commuter service regularly operates on the affected line, a number of alternatives could be planned for and instituted to minimize inconvenience (bus, bus/rail, rail/bus bypass/rail).

The planning process must be sufficiently flexible so that it can respond effectively to incidents irrespective of time of day, day of week, time of year, population density and probably mobility of individuals in the potential disaster area.

Sabotage

Although a sabotage incident on the rail network is possible, the outage would have only a short run effect. The most likely target would be in areas where main line carriers operate on adjacent trackage and, in particular at critical defiles.

Examples of other potential targets for sabotage which would have both short run and possible long run effects on the rail system throughout Ontario are:

a) St. Lawrence Seaway System

There are critical points in the system which are potential targets for either total or partial disruption of marine services on the Great Lakes and the St. Lawrence. An event or a combination of events at the locks at Sault Ste. Marie and/or the Welland and Beauharnois Canals could force traffic on to other transportation modes in the Province. The greatest impact would be on the railways, as most of the traffic to be diverted would involve bulk products. Although mainline ton mile trackage capacity may be capable of meeting the additional freight traffic demand for a limited short run duration, problems will probably arise with respect to the availability of motive power and cars for sustained long term services.

Another factor which affects the rail carriers is the capability of the cargo origin and destination points to provide handling services (loading and off-loading facilities and additional storage capacity) to permit quick turn around of the unit trains which would have to be committed to meet the tonnage demands.

b) Nuclear Power Station (Pickering)

It is probable that a sustained outage at the Pickering site could be met by diverting power from the Ontario Hydro Grid. However, should an incident occur at this site either by sabotage or accident, the main east/west rail and road systems in the Province would be affected/

The impact of such an event on the transportation system would be substantially influenced by the level and duration of the emission. It is very difficult, therefore, to forecast the probable alternative rail traffic routings for service to southern and south western Ontario.

The extent to which it is practical to use the rail service to assist in evacuation of the public from the damage area must also be considered.

c) <u>Oil and Gas Pipelines</u>

The extent to which a sabotage event(s) on either the Trans-Canada Pipeline (T.C.P.L.) and/or the Inter-Provincial Pipeline (I.P.P.L.) would impact on the Provincial transportation system would depend upon the location(s) and the degree of the incident(s).

1. <u>I.P.P.L.</u>

If the event(s) occurred west of Duluth and damage could not be resolved within the time limits of the normal refinery reserves (60 to 90 days), rail and road alternatives would have to be introduced. The greater impact would be placed on the railways than on the road carriers because of the bulk nature of the product. If the incident occurred east of Duluth and the repair time was similar to that above (beyond 60/90 days), marine service from Duluth could be introduced to those refineries which have the

capability of accepting supplies from marine carriers. A partial alternative to both of the above is the possibility of a reverse flow on the Sarnia/Montreal line to accept product from the Montreal refineries serviced by the Portland Pipeline, if off-shore supplies to meet demand could be provided.

2. T.C.P.L.

Irrespective of the event(s) occurring east or west of Thunder Bay, the cost and time to construct the infrastructure to provide alternatives to move natural gas, either for an extended short run or long run period, would make such an option unlikely.

A long run alternative which would impact on the rail and marine carriers is the establishment of coal gasification plants. Should a decision be taken to undertake such projects, it is presumed that construction of gas conversion facilities would provide sufficient lead time to permit the railways to construct additional trackage, if required, and procure the necessary motive power and cars.

National Political Instability

At this critical time of national constitutional reform, pressures are being placed on the federal authorities which, in both the short and long run, could have a serious effect on the provincial transportation system. Although it may not be prudent to speculate on the vagaries of the domestic political process, it would be unwise to totally ignore the possibility of events which may arise.

If the provincial governments which control the source and production of hydrocarbon fuels decided at some future time to use these as a pawn to gain a position of strength for negotiations, it is possible that energy supply from such sources could be reduced or denied to Ontario.

If events were to arise where Ontario came into direct competition with foreign governments for domestic hydrocarbon fuels, a re-evaluation of provincial energy production means would be necessary before a valid assessment could be made of the transportation needs. As an example, if a major shift to coal based energy production was undertaken, alternative sources of coal supply are available in North America and off-shore. North American supply would, for the most part, be rail, marine and marine/rail delivered. Off-shore supply delivery would be by marine and rail, depending upon the source and time of year.

Although it may be assumed that rail equipment now dedicated to the movement of Canadian coal into and through Ontario would be re-allocated for the new source movement, the extent of the impact on the national rail carriers because of a change in coal supply source, either North American or off-shore, would require detailed study.

While Canada's future as a unified nation now seems assured, recently there was the possibility of a province's secession from the Dominion of Canada. Although the likelihood of such an event occurring has greatly diminished, nevertheless, the lessons so recently taught indicate that a number of transportation matters key to the future interests of Ontario probably should be addressed.

For example, with respect to the St. Lawrence Seaway, will marine traffic transiting through it and the St. Lawrence River continue to function on the present international agreement, or will a separate bilateral pact have to be negotiated? If the latter were to happen, changes to operating procedures and toll structures might cause modal shifts in traffic which could have a major impact on the railways in Ontario.

Should traffic diversion through the United States occur, it is likely that the carriers would use Ontario "gateways" to maximize profitability. Separate studies would be required to assess the impact on current rail services, particularly in southern and south western Ontario.

With respect to road carrier services, traffic diversions are less restrictive. Should operators decide to by-pass another province through the United States, delays may occur at Ontario border crossing points. Also, loads transported might be limited by existing facilities at the access points.

Other common problems which would affect seaway operations east of Ontario, as well as marine, rail and mode operators, are transportation and labour legislation, policy and regulations.

Nuclear/Biological Incidents

The types of nuclear and biological events which may affect the provincial transportation system and occur in other than a sabotage event or under war conditions include:

a) uncontrolled radiation at a production, refining, major end-use site (i.e. power plant) and waste disposal sites or, while the product is in transit.

b) accidental release of biological substances at research and/or production facilities and at end use or waste disposal sites or while the product is in transit.

New federal legislation (Bill C-18), referred to above under Dangerous/Hazardous Cargo, and other federal Acts and regulations such as the Atomic Energy Control Act, have been instituted to ensure maximum safety precautions are taken to prevent incidents.

Nevertheless, accidental release of harmful materials is a possibility. A recently reported incident of damage to a container of radio-active material at the Toronto International Airport (June 20 1980 - Carrier - Air Canada) is an indicator of the possibility that a major incident could occur.

To determine the impact of a potential event on the rail network in Ontario would require studies in detail of at least the major locations where the incidents may occur, the lethality of the product and modes for product transportation (i.e. carrier, origin/destination, etc.). If the recent incident at Toronto International Airport had not been contained, it is conceivable that the area could have been closed and air traffic diverted. Rail and road services would have been required to selected alternative airports for passengers and cargo destined for, departing from or transiting through Toronto.

Others

There are a number of other potential man-made events which could affect, to varying degrees, the provincial transportation system. Some of these events may be limited in scope (i.e. affect Ontario only), others may be national in nature. Except for a war situation, it is likely that the impact of these events would be short run. Examples of such events are:

a) War

The level of war activity could range from a conflict limited in scope (i.e. Korean type) to a global conflict. The impact on all modes of transportation would depend upon the activity level and the areas of operation.

The extent to which rail service would have to be increased would depend on the expansion and dispersion of war production and military facilities and the increase in demand for freight and passenger services caused by a fuel rationing system. Past experience has proven that, given the incentives and allocation of resources, national rail carriers can respond to meet traffic demands provided enemy action does not prevent it.

b) Apprehended Emergency

It is anticipated that incidents in this category would be declared by federal authorities. The circumstances leading to such an event could be increased international tension (short of war), civil unrest, national political instability, threat of sabotage or covert operations by clandestine groups.

Faced with the prospect of such a threat, authorities may find it necessary to impose restrictions on certain transportation services. An example may be the diversion to U.S. carriers through southern Ontario "gateways" of all east and/or west bound rail traffic which regularly transits through Ontario on northern main lines. The imposition of such a diversion could have a substantial impact on rail mainline and commuter service in southern Ontario and cause shifts to other modes.

c) International Assistance

The possibility of either man-made or natural disasters occurring in the United States adjacent to Ontario border crossing points could have an impact on road and rail services in Ontario. Should such a disaster occur, it may well be that the only practical escape route is into or through Ontario. Many of the refugees may require transportation to temporary shelter in or out of the province. To contend with such an emergency it may be necessary to re-allocate train and bus resources from regular services or divert equipment at non-peak periods.

NATURAL EVENTS

Loss of Oil Supply

The intent of the Federal Government to make Canada self sufficient by the Year 2000 does not rule out the possibility of a loss of fuel supply prior to the achievement of that goal. International events since 1973 have shown how tenuous can be our reliance on off-shore supply for national crude oil needs. Continued instability in the Middle East could result in a man-made loss of that supply. Unless domestic production could be increased, other off-shore sources found or oil substitution energy forms established, the rate of consumption of current domestic crude will increase and present proven national stocks be depleted earlier than forecast.

The impact of such an event on the provincial transportation system and the possible short and long run options are similar to those described earlier under Fuel Supply Stoppage. In addition, a further essential option is the conduct of a total reassessment of present and anticipated future energy consumption patterns by the public, as well as by the Canadian extraction, production, physical distribution and agricultural sectors to determine the most energy efficient, cost effective and environmentally acceptable means for each sector. Through such a process, energy supply and demand could be totally managed, and a standard cost for an equivalent heat unit set. Mechanisms could be established to promote efficiency and competition.

It is conceivable that, with our substantial reserves of natural gas, and our relatively unlimited supply of uranium, coal and hydro-electric potential, conversion to these energy sources may be the most practical alternatives for some sectors. The effects of such a decision on the rail service in the province would be substantially influenced by:

1. the location of the sectoral elements that may be deemed most suitable for conversion to non-crude energy,
2. the type and volume of the non-crude energy to be used, and
3. the means of product transportation.

As an example, if it were decided that major conversion to coal-based energy was to take place in Ontario, the product flow from either eastern or western sources would be rail, rail/marine/rail or pipeline. The rail and marine modes are most likely to be used initially as most of the transportation infrastructure exists. Although the national rail carriers' main line operational capacity may be capable of handling a major increase in unit trains, (100/120 cars - 10 to 12 thousand tons), it is likely that up-grading of branch lines, changes to and installation of handling and servicing yards and other infrastructure would be required. Depending upon the location of the end use site, there could be traffic densities which would create disruption to normal passenger/commuter and freight services. Further, the volume and type of product being moved might create negative local public reaction because of environmental problems (air, noise, visual).

Catastrophic Weather Event

It is unlikely that a catastrophic weather event, although creating suffering and heavy financial loss, would have any long run effect on the provincial transportation system.

The main impact on the rail services would depend to the greatest extent on the location of and the localised disruption caused by the incident. The loss of a major bridge on a high density route where national carriers share joint running rights is the type of an example in which the most serious rail service disruption could occur. Although the damaged area could be by-passed by alternate lines or temporary re-routing trackage laid, delays in service would occur.

With respect to the foregoing, if the outage occurred on a line servicing rail commuter traffic, a bus by-pass service could be instituted to a convenient rail pick-up point.

Depending upon the location of the incident, there may well be a major role to be played by the rail services in the evacuation of the public and, perhaps, livestock or other strategic materials from the stricken area.

If the incident occurred in an urban or rural area, re-location of the dispossessed to temporary shelter could be arranged reasonably quickly because the incident location could probably be approached from several directions. Further, public safety and volunteer services from adjacent unaffected areas could be used at

collection and transit centres and for command and control. Evacuation from a frontier area (high north and north western Ontario) would be more complicated because of the shortage of surface transport arteries and the minimum number of public safety and volunteer service personnel adjacent to the incident area.

If the outage(s) occurred on main or branch lines, the railway would implement plans to provide by-pass service to minimize the inconvenience to the user. The planning responsibility for such should rest with the agency providing the service (VIA, GO, etc.).

Although it is not possible to predetermine the location or timing of a catastrophic weather event, there are, however, planning steps which could be taken to permit quick reaction in order to reduce the effect upon the public and on property.

Fire

Unlike a catastrophic weather event, the possibility of a serious forest fire occurring annually in the province is quite predictable. Although it may not be possible to predetermine the precise locations, severity or timing of such events, the general areas are reasonably forecastable. The possibility that such an event would have a long run effect on the provincial transportation system is not high.

As the main transcontinental lines of the national rail carriers cross high potential forest fire areas, there is an annual threat that the service could be curtailed or disrupted. Except for a small percentage

of the service the physical separation of the C.N. and C.P. lines is such that the possibility of simultaneous closure of both lines is low. Nevertheless, the severity of the terrain limits the carriers' options with respect to providing by-pass services in the event of an outage.

If both main transcontinental lines were closed, the following are possible alternative service options:

1. Incident east of Thunder Bay -
   a) bulk products and heavy loads could be transferred to marine mode, (Seaway season only),

   b) general cargo, express and package freight could be transferred to road service.

2. Incident west of Thunder Bay or during Seaway closure -
   the traffic could be re-routed over U.S. lines.

As discussed earlier, changes in energy supply could result in substantial increases in coal tonnage movement on the transcontinental service. Detailed studies would be required to determine whether and for how long a single carrier service could sustain the potential traffic flow, particularly during the period of Seaway closure. (It is assumed that marine services would be used for coal movement when the Seaway is open).

The possibility exists that other types of serious fire (other than through war), could occur which would severely affect the delivery of rail services in the province.
Some examples are:

a) The destruction of the Toronto Union Station terminal facilities and adjacent passenger marshalling yard.

b) An incident at Toronto International Airport causing closure of all services for an extended period (beyond 30 days).

c) An incident at a major Seaway lock site during the peak shipping period.

POLICY PERSPECTIVE

Integrated Planning

Each of the foregoing and other possible man-made or natural disaster events would have a serious impact on the industrial, commercial and social interests of the province. It could be argued that, as the rail mode operators have the technical and operational control for their services, it is their prime responsibility to develop and institute contingency plans to minimize the effect of such an event.

We know that when an incident of any size occurs, many agencies, in addition to the mode operators, become involved, each having its own priorities, motives and expectations. Unquestionably, reinstitution of service as quickly as possible is the desired goal. However, the event itself may be the catalyst around which desired rail system changes should be introduced. The present rail network in Ontario was established at a time and under a different set of economic and demographic conditions than exist today or may be expected in the future.

Technological change and some rail relocation has taken place within capital limitations to improve individual carrier service and efficiency. Whether such changes have led to an overall improvement in the total rail system or have been consistent with provincial objectives is questioned.

The lack of a cooperative coordinated approach to system change is not unique to Ontario; it is national in scope. The problem has been created by uncertainty in key areas such as:

a) <u>Roles and Responsibilities</u>
There is a need for clearly defined, mutually understood and agreed upon roles and responsibilities of the users and providers of the system, as well as the provincial and federal governments.

b) <u>Priorities and Guidelines</u>
A clear definition should be given with respect to the direction in which the system must be developed.

c) <u>Decision-Making</u>
The lack of major policy and planning respecting long term system impacts prevents timely, well informed, action oriented decisions.

d) <u>Process</u>
Better processes need to be established in the areas of communication and information exchange, mutual understanding and coordination if adequate mechanisms are to be established through which system users, providers and policy-makers can interact.

Within the time constraint permitted for this study, it is not possible to fully explore the areas in which integrated planning should take place between federal and provincial agencies and system users and providers. However, the need for a formalized structure exists.

Planning for Emergencies

Some of the events discussed in the foregoing may be predictable with respect to approximate timing and/or location (e.g. Forest Fires and Fuel Cost increases); but, most are likely to occur without warning. The speed with which action can be taken to limit the risk, damage and loss of life, and the impact on the rail system, will depend upon the level of pre-planning undertaken.

It would not be practical to attempt to develop specific detailed scenarios for each possible event. However, overall structure and outline plans to meet contingencies should be established. The Federal Government has recognised the importance of this activity by the creation of an Emergency Planning Agency with representation at provincial level. It is understood that the Government of Ontario has designated certain areas where emergency measures are to be instituted.

Although specific ministries within the provincial government may be charged with responsibilities to react to emergency situations, it has not been possible to determine how coordination is effected below Cabinet level. A need exists to establish at the senior officials' level a coordinating agency which can integrate planning and conduct command, control and communication exercises to increase efficiency and improve the reaction response time of organizations which may be committed to emergency events.

Emergency Response Units

In the event of an emergency, it is likely that municipal and regional officials, local public safety and volunteer agencies and local management of the affected facility or service would be the first on site. Depending upon the potential impact of the event on the rail system and the public, it may be necessary to augment local response units with provincial assistance which, in turn, can be integrated with federal assistance if it is required in the national interest.

Although adjacent municipalities, regions or services may be expected to provide the initial augmentation elements, the threat of the event spreading to their areas of responsibility may preclude such an option. Therefore, arrangements should be made to provide assistance well beyond the event area. The locale and composition of such units should be identified now.

To meet such a contingency, it is essential that a Provincial Operations Centre be established as quickly as possible. The Operations Centre, in addition to providing the means for provincial local command and control, would be the focal point at which provincial officials, public safety, volunteer agencies and the management of the affected services or facility could control the operation.

In conjunction with the local Operations Centre, it is important to establish a local Information Centre to satisfy public and media inquiries. Unless this is done, the effectiveness of the Operations Centre could be impaired.

Responsible Individuals

The identification of all responsible individuals who may be involved in the resolution of an event has not been possible in the time allowed. Clearly some ministries and provincial agencies would be involved in all events. Others would become involved depending upon ministry responsibility or agency task. A further factor is the constitutional responsibility for the service or facility where the event may occur.

Irrespective of the event, it is anticipated that the following ministries would be involved:

Attorney General
Solicitor General
Health
Transportation and Communications
Intergovernmental Affairs
Government Services

In addition to the foregoing, the following ministries may be involved depending upon the event:

Energy
Environment
Natural Resources
Treasury and Economics
Northern Affairs

29.

RECOMMENDATIONS

1. Establish a Federal/Provincial Transportation Policy and Planning Committee to define:

   Roles and responsibilities
   Priorities and guidelines
   Decision-making mechanisms
   Better processes for coordination and cooperation
   Financing mechanisms

2. Establish a Provincial Coordinating Agency, properly staffed, to undertake flexible contingency planning which would be capable of integration with a major federal operation, in case of national emergency.

3. Provide for the establishment of Operation and Communication Information Centres for disaster sites.

4. Establish quick response units for immediate deployment to disaster sites.

5. Identify and task specific ministers and principal ministry officials for each potential contingency.

6. Develop transportation-impact scenarios with appropriate representatives of the rail, marine, truck, bus, air modes.

7. Conduct a further detailed assessment of events described in the study and other potential events which may be identified.

8. Conduct test exercises.

ANNEX "A"

ONTARIO TASK FORCE ON PROVINCIAL RAIL POLICY
TASK DESCRIPTION
PREPARED BY STAFF OF THE TASK FORCE SECRETARIAT

TASK: The "W.I.?" Scenario

PURPOSE To develop a broad perspective on the possible role of rail transportation given various critical or emergency situations and to show to what extent rail serves a strategic need in Canada's and Ontario's future.

OUTPUT REQUIRED:

1. A list of the various "what ifs" for which an action plan should be prepared, e.g. oil shortages, war, natural or man-made disasters, etc.
2. A provincial policy perspective on the role(s) that rail might or should play in responding to the demands of the identified emergency situations.
3. What should Ontario do to protect its interests?

TO BE ASSIGNED TO:

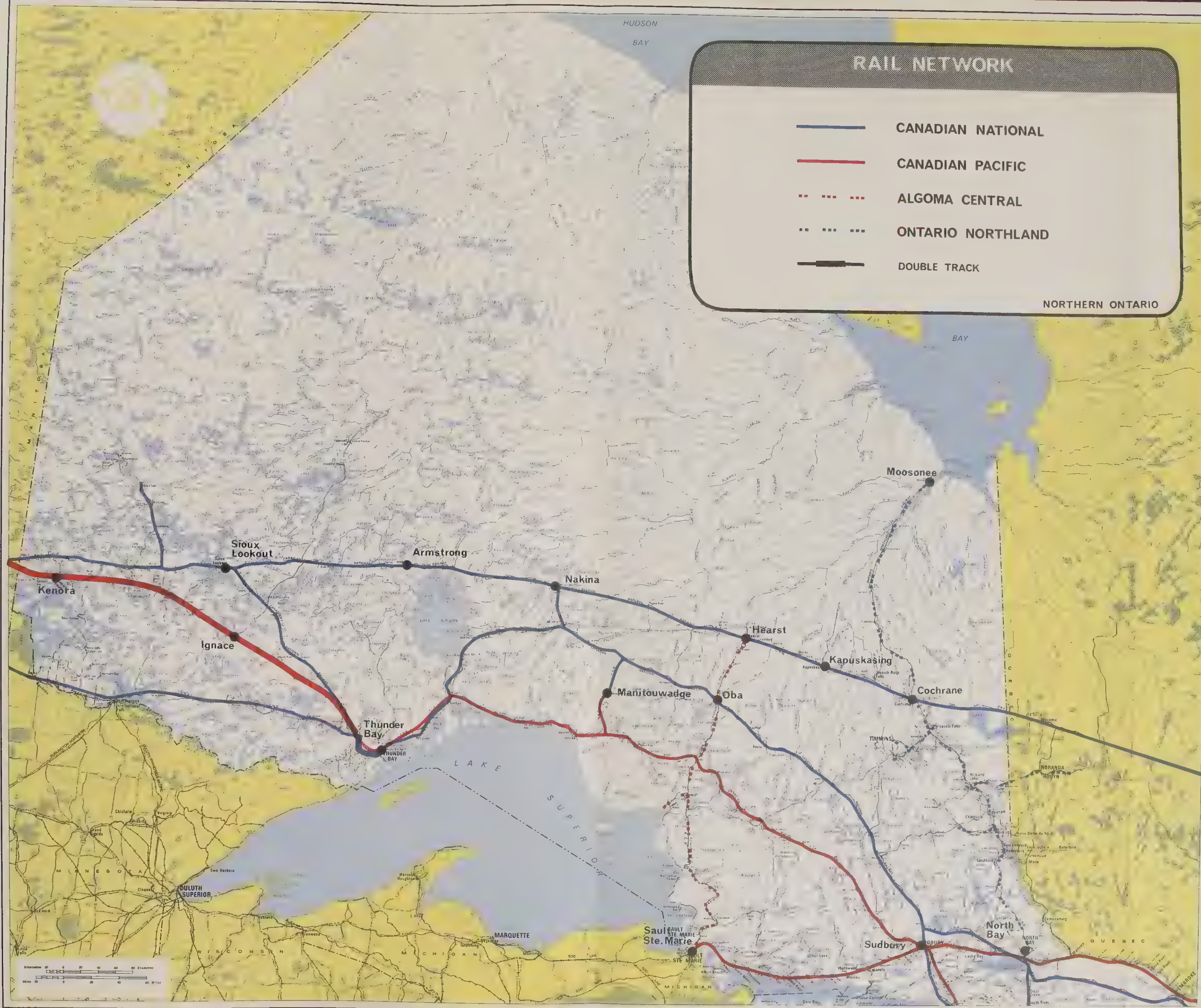
Consultant

COMPLETION DATE:

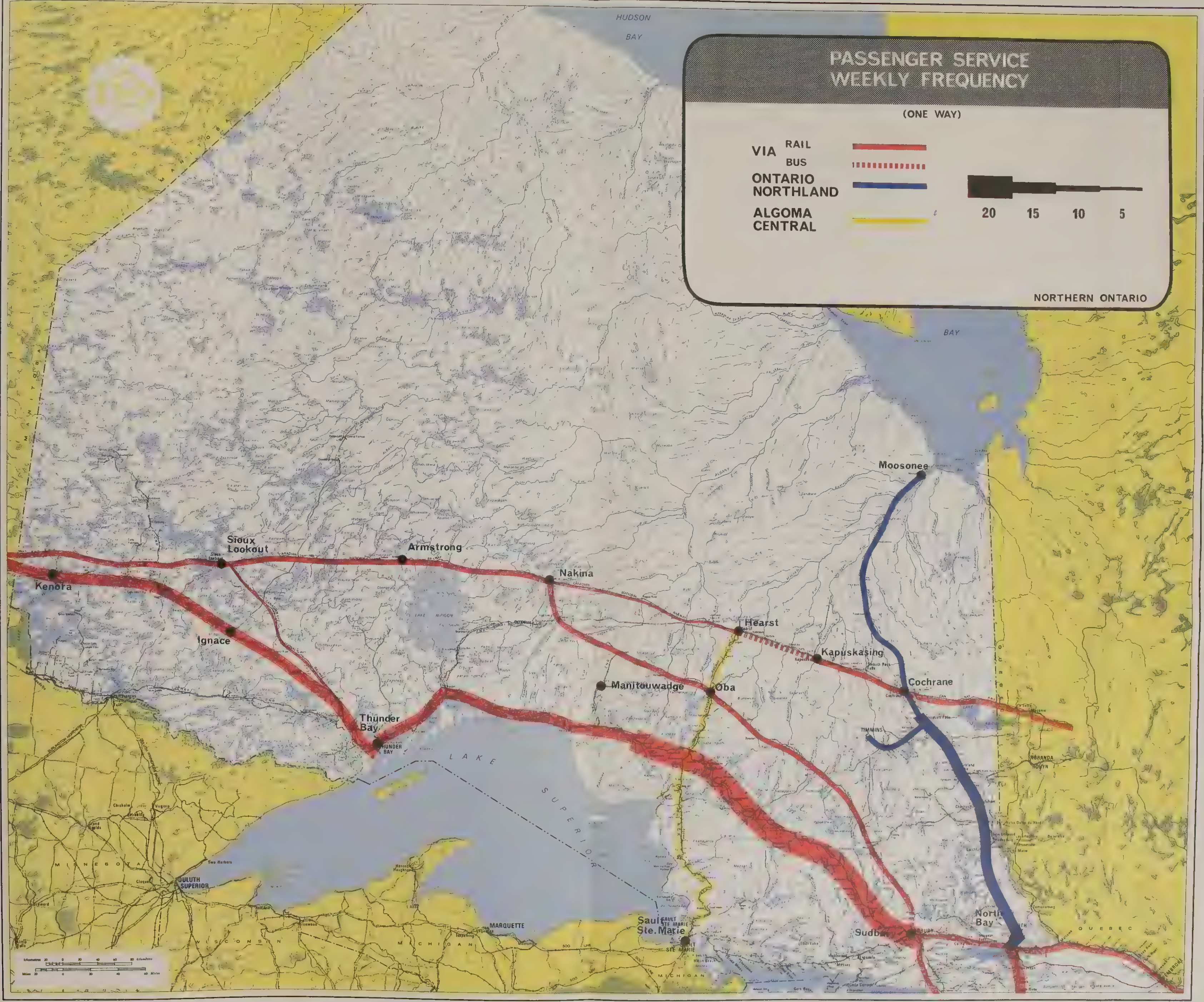
July 23, 1980

APPENDIX

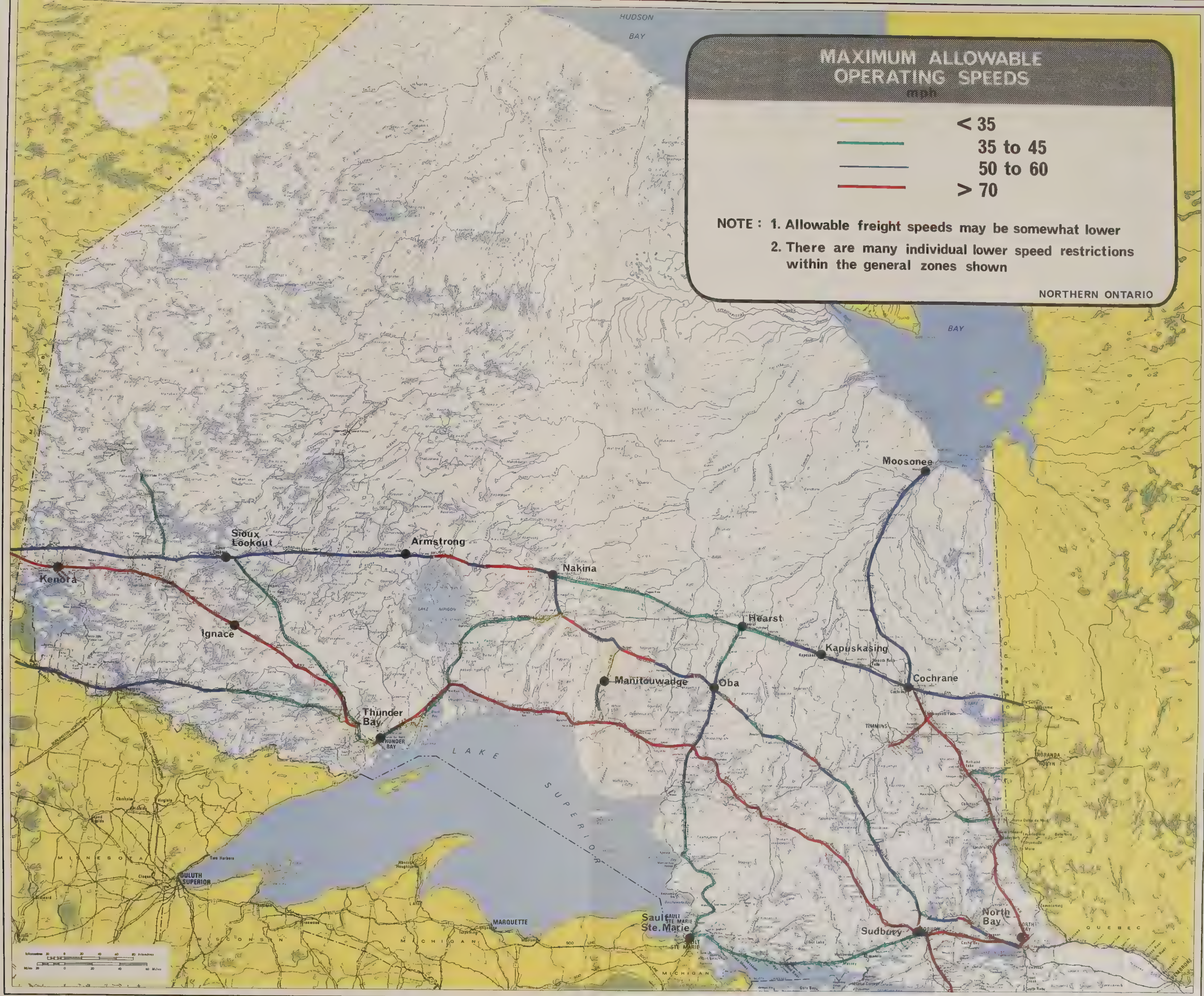
MAXIMUM ALLOWABLE
OPERATING SPEEDS
mph
< 35
35 to 45
50 to 60
> 70
NOTE : 1. Allowable freight speeds may be somewhat lower
2. There are many individual lower speed restrictions within the general zones shown
NORTHERN ONTARIO
HUDSON
BAY
BAY
Moosonee
Sioux
Lookout
Armstrong
Nakina
Kenora
Ignace
Hearst
Kapuskasing
Cochrane
Manitouwadge
Oba
Thunder
Bay
TIMMINS
LAKE
SUPERIOR
DULUTH
SUPERIOR
MARQUETTE
Sault
Ste. Marie
Sudbury
North
Bay
MINNESOTA
WISCONSIN
MICHIGAN
QUEBEC


RAIL NETWORK
CANADIAN NATIONAL
CANADIAN PACIFIC
ALGOMA CENTRAL
ONTARIO NORTHLAND
DOUBLE TRACK
NORTHERN ONTARIO
HUDSON
BAY
BAY
MANITOBA
Moosonee
Sioux Lookout
Armstrong
Nakina
Kenora
Ignace
Hearst
Kapuskasing
Cochrane
Manitouwadge
Oba
Thunder Bay
THUNDER BAY
LAKE SUPERIOR
TIMMINS
NORANDA
North Bay
Sudbury
Sault Ste. Marie
DULUTH
SUPERIOR
MARQUETTE
MINNESOTA
WISCONSIN
MICHIGAN
QUEBEC
PEMBROKE

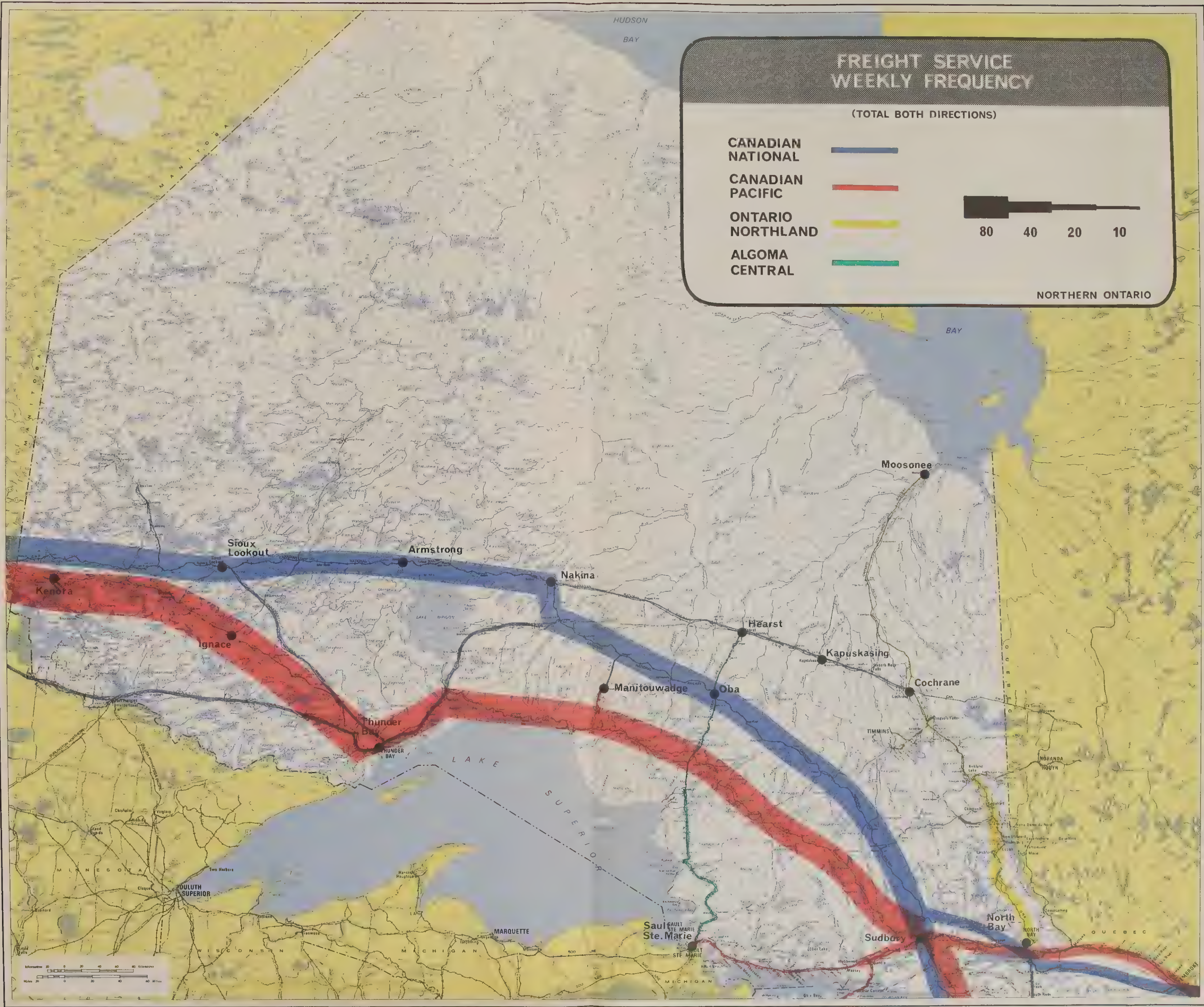

PASSENGER SERVICE
WEEKLY FREQUENCY
VIA Rail
80
40
20
10
SOUTHERN ONTARIO
NORTH BAY
PEMBROKE
GEORGIAN BAY
LAKE HURON
OWEN SOUND
ORILLIA
BARRIE
PETERBOROUGH
BROCKVILLE
OGDENSBURG
CORNWALL
MASSENA
METROPOLITAN TORONTO
MISSISSAUGA
BRAMPTON
GUELPH
KITCHENER
WATERLOO
CAMBRIDGE
STRATFORD
BURLINGTON
HAMILTON
ST CATHARINES
WOODSTOCK
BRANTFORD
LONDON
SARNIA
ST THOMAS
CHATHAM
BUFFALO
ROCHESTER
SYRACUSE
UTICA
ERIE
CLEVELAND
SANDUSKY
LAKE ONTARIO
LAKE ERIE
ONTARIO CANADA
NEW YORK U S A
MICHIGAN U.S.A.
ONTARIO CANADA
THOROLD


PASSENGER SERVICE
WEEKLY FREQUENCY
(ONE WAY)
VIA RAIL
BUS
ONTARIO NORTHLAND
ALGOMA CENTRAL
20
15
10
5
NORTHERN ONTARIO
HUDSON BAY
BAY
Moosonee
Sioux Lookout
Armstrong
Nakina
Kenora
Ignace
Hearst
Kapuskasing
Cochrane
Manitouwadge
Oba
Thunder Bay
TIMMINS
LAKE SUPERIOR
DULUTH SUPERIOR
MARQUETTE
Sault Ste. Marie
Sudbury
North Bay
QUEBEC
MICHIGAN
WISCONSIN


MAXIMUM ALLOWABLE OPERATING SPEEDS
mph
< 35
35 to 49
50 to 69
> 70
NOTE : 1. Allowable freight train speeds may be somewhat lower
2. There are many individual lower speed restrictions within the general zones shown
SOUTHERN ONTARIO
NORTH BAY
PEMBROKE
OTTAWA
CORNWALL
OGDENSBURG
BROCKVILLE
KINGSTON
BELLEVILLE
PETERBOROUGH
OSHAWA
ORILLIA
BARRIE
OWEN SOUND
METROPOLITAN TORONTO
MISSISSAUGA
BRAMPTON
GUELPH
WATERLOO
KITCHENER
CAMBRIDGE
STRATFORD
BURLINGTON
HAMILTON
ST CATHARINES
BRANTFORD
WOODSTOCK
LONDON
SARNIA
ST THOMAS
CHATHAM
BUFFALO
ROCHESTER
SYRACUSE
UTICA
ERIE
CLEVELAND
SANDUSKY
LAKE ONTARIO
LAKE ERIE
ONTARIO CANADA
NEW YORK U.S.A.
ONTARIO CANADA
MICHIGAN U.S.A.
ONTARIO CANADA
OHIO U.S.A.
QUEBEC


MAXIMUM ALLOWABLE
OPERATING SPEEDS
mph
< 35
35 to 45
50 to 60
> 70
NOTE : 1. Allowable freight speeds may be somewhat lower
2. There are many individual lower speed restrictions within the general zones shown
NORTHERN ONTARIO
HUDSON BAY
BAY
Moosonee
Sioux Lookout
Armstrong
Nakina
Kenora
Ignace
Hearst
Kapuskasing
Cochrane
Manitouwadge
Oba
Thunder Bay
LAKE SUPERIOR
DULUTH SUPERIOR
MARQUETTE
Sault Ste. Marie
Sudbury
North Bay
TIMMINS
QUEBEC
MICHIGAN


FREIGHT SERVICE
WEEKLY FREQUENCY
(TOTAL BOTH DIRECTIONS)
CANADIAN NATIONAL
CANADIAN PACIFIC
80
40
20
10
<10
NOTE: Unit trains & seasonal or other "extras" not included.
(North & South Ontario)
SOUTHERN ONTARIO
NORTH BAY
PEMBROKE
OWEN SOUND
ORILLIA
BARRIE
PETERBOROUGH
OSHAWA
METROPOLITAN TORONTO
MISSISSAUGA
GUELPH
WATERLOO
KITCHENER
STRATFORD
BURLINGTON
HAMILTON
ST CATHARINES
BRANTFORD
WOODSTOCK
SARNIA
ST THOMAS
CHATHAM
KINGSTON
BROCKVILLE
ROCHESTER
BUFFALO
SYRACUSE
UTICA
ERIE
CLEVELAND
SANDUSKY
ONTARIO CANADA
NEW YORK U.S.A.
ONTARIO CANADA
MICHIGAN U.S.A.
ONTARIO CANADA
OHIO U.S.A.
QUEBEC
ONTARIO


FREIGHT SERVICE
WEEKLY FREQUENCY
(TOTAL BOTH DIRECTIONS)
CANADIAN NATIONAL
CANADIAN PACIFIC
ONTARIO NORTHLAND
ALGOMA CENTRAL
80
40
20
10
NORTHERN ONTARIO
HUDSON BAY
BAY
MANITOBA
Moosonee
Sioux Lookout
Armstrong
Nakina
Kenora
Ignace
Hearst
Kapuskasing
Cochrane
Manitouwadge
Oba
Thunder Bay
LAKE SUPERIOR
North Bay
Sudbury
Sault Ste. Marie
DULUTH SUPERIOR
MARQUETTE
MINNESOTA
WISCONSIN
MICHIGAN
QUEBEC

ONTARIO TASK FORCE

ON PROVINCIAL RAIL POLICY

1978

Ontario